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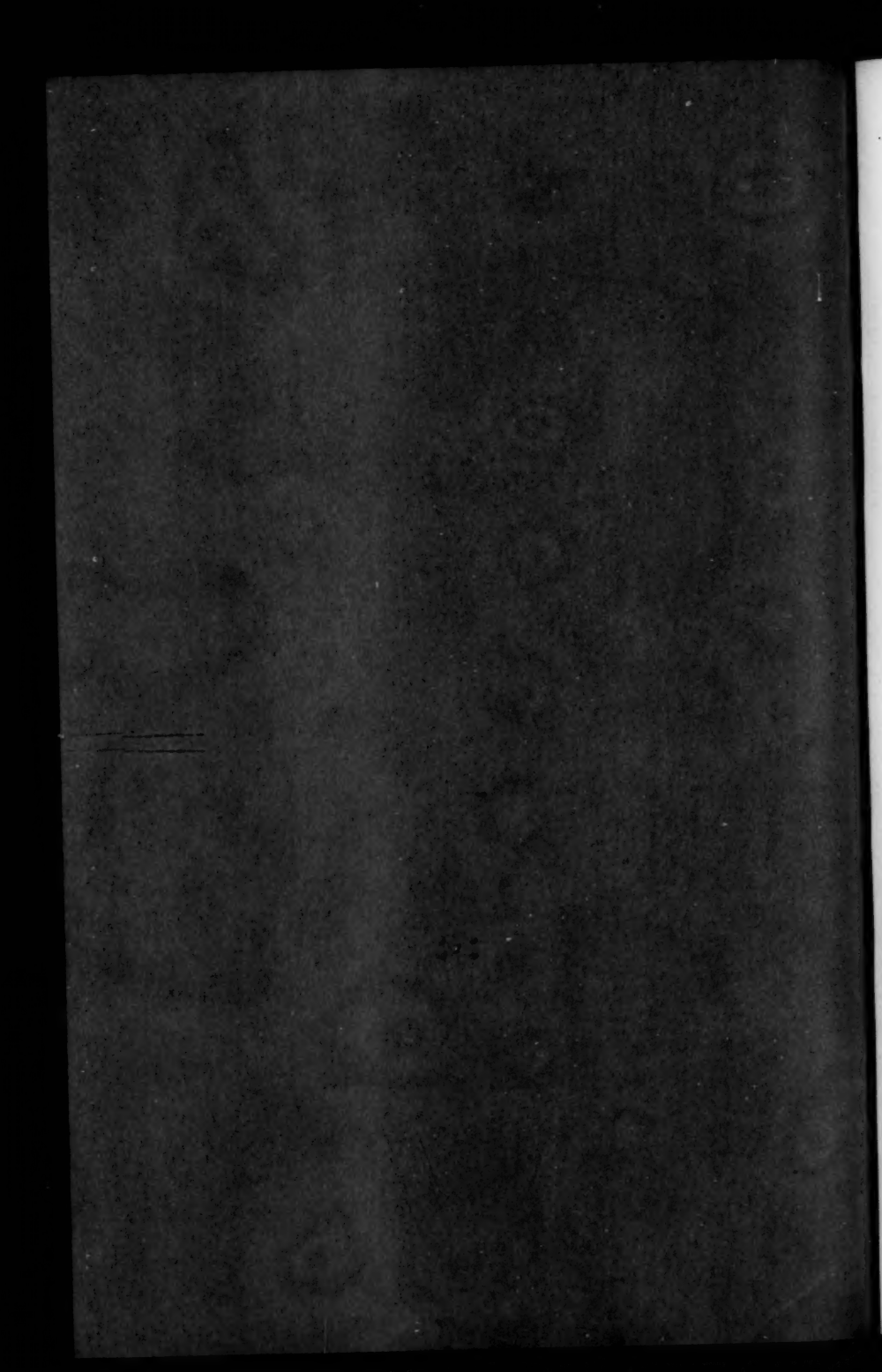

WILDLIFE REVIEW

An abstracting service for wildlife management
Issued for the information of cooperators
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Except as indicated, abstracts are by William H. Stickel, editor.

NATURAL RESOURCES & CLIMATE

Callison, Charles H., editor. AMERICA'S NATURAL RESOURCES. Ronald Press, N. Y. 10, N. Y. v + 211 p. 1957. $3.75.

Sponsored by the Natural Resources Council of America and written for responsible laymen who "lack the essential background for an informed approach to the problems of conservation." The authors, all experts, place the problems of each renewable resource in historical perspective, tell what is being done, and show what still needs to be done. The whole book is simply written, easily understood, and concise. It emphasizes trends, principles, and policies. It should be highly illuminating as a reader for laymen and it should make an excellent text for a short course. Chapters are: Conservation: an ecological approach, by S. W. Allen. Renewable resources and human populations, by Fairfield Osborn. Soil, by F. E. Bear. Water, by H. G. Wilm. Grasslands, by D. F. Costello. Forests, by Henry Clepper and Lowell Besley. Wildlife, by J. J. Shomon. Fish, by A. S. Hazzard and Wm. Voigt, Jr. Parks and wilderness, by Howard Zahniser. Land use principles and needs, by E. H. Graham. Needed: a natural resources policy, by I. N. Gabrielson. An appendix gives A policy for renewable natural resources, which has been adopted by the Natural Resources Council of America.

Otte, Robert Charles. THE SMALL WATERSHED PROGRAM IN WISCONSIN. Ph.D. thesis, U. Wis. 174 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]

Survey of Wis. program and effects of Public Law 566, which provides Federal technical and financial aid to local small watershed projects. It was found that such aid could be better used when there was a local organization for program integration, and that there was need for aid in setting up such groups. Several recommendations are made concerning local financing procedures.--L. F. Stickel.

RESOURCES FOR THE FUTURE. ANNUAL REPORT FOR THE YEAR ENDING SEPTEMBER 30, 1956. Resources for the Future, 1145 19th St. NW., Wash., D. C. v + 85 p., maps & graphs. Dec. 1956.

This institution, financed by the Ford Foundation, undertakes and subsidizes studies that are basic to understanding of resource problems. Economic studies of resources in relation to human populations are one of the chief approaches. Many projects of this type are under way. Water, energy, and mineral resources are receiving much attention of this sort. Management of resources is the subject of several research projects, and management of public lands is included. Work on economics and planning of regional development is currently focused on suburban problems and the subarctic. Experimental work in resource education is in progress. Direct aid is being given to research in forest biology, especially forest genetics. Resources for the Future has a relatively small research staff. Much of its work is done by making grants of aid for specific projects to universities and special consultants. A high degree of flexibility is thus retained and specialized talent can be drawn upon as projects evolve.

White, Gilbert F., editor. THE FUTURE OF ARID LANDS. Am. Assn. Adv. Sci. (1515 Mass. Ave. NW., Wash. 5, D. C.). 464 p., illus. 1956. $6.75. [From review by W. E. Akin, J. Soil & Water Cons. 12(2).]

Result of international meetings held in N. M. in 1955. Specialists from 28 countries attended and papers were presented by participants from 18 countries. These papers and the conference recommendations constitute the present volume. "The wide scope of these meetings is indicated by the major topics under which the papers are presented in the book: The Broad View, Variability and Predictability of Water Supply, Better Use of Present Resources, Prospects for Additional Water Sources, and Better Adaptation of Plants and Animals to Arid Conditions. The concluding chapter contains 31 recommendations for further research in the arid zone in the fields of Anthropology, Archaeology, Geography, Meteorology, Climatology, Hydrology, Geology, Soils, Biology, Ecology and Conservation." Need of interdisciplinary attack on problems is brought out. "Also of interest are the fascinating possibilities suggested in the selection and development of plants and animals of the arid regions, the demineralization of saline waters, weather modification, and land and water conservation." The book is "an invaluable source of information on arid-land problems for those interested in the broad aspects of land use."

SOILS

Goodman, K. V., and others. SOIL SURVEY OF PRENTISS COUNTY, MISSISSIPPI. US Soil Cons. Serv., Ser. 1942, no. 16. 1-145 p., illus. + large folding maps. Feb. 1957. Price not stated. Order from Supt. Documents.

Rourke, John D., and others. SOIL SURVEY OF LIVINGSTON COUNTY, MISSOURI. US Soil Cons. Serv., Ser. 1950, no. 1. 1-54 p., 2 maps + large folding maps. Dec. 1956. $2.00 from Supt. Documents.

CONSERVATION EDUCATION

Gilbert, Douglas L. (Colo. State U.) TELEVISION AS A WILDLIFE-EDUCATION MEDIUM. J. Wildl. Mgt. 20(4): 456-458. Oct. 1956.
Tells how a series of TV programs was handled at Grand Junction, Colo., suggests policies wildlife biologists should follow in arranging conservation programs, and outlines contents of 52 fifteen-minute programs.

O'Connor, Henry Arthur. THE ADMINISTRATION OF CONSERVATION COURSES IN CERTAIN SECONDARY SCHOOLS IN THE UNITED STATES. Ed.D. thesis, U. Mo. 211 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]
Survey of status and operation of these courses throughout U. S.

Wade, Douglas E. (S. C. Wildl. Resources Comm.) THE TEACHER'S ROLE IN CONSERVATION. S. C. Education News 13(4): 14-17, 3 photos. Dec. 1956.
Gives brief discussions of the 6 characteristics of a good local conservation education program. These characteristics, decided upon by 120 educators, are: leadership and administration, teaching staff, relationship of the school to community and outside agencies, instructional program and its planning, manner of teaching, and evaluation of program. The list can serve as a checklist for those attempting to survey or evaluate the conservation education program in any local school or system.--Author.

BIBLIOGRAPHIES, DIRECTORIES, BIOGRAPHY, HISTORY

Arnett, Ross H., Jr., compiler. (St. John Fisher Coll., Rochester 18, N. Y.) BOOKS ON ZOOLOGY. Soc. Syst. Zool. vii + 72 p. Dec. 1956. "Available without charge to zoologists, teachers, librarians."
The first part lists, by subject, books that can now be purchased from U. S. commercial or academic publishers. The 46 subject headings include such groupings as natural history, arachnids, birds, mammals, anatomy, behavior, ecology, parasitism, conservation, and economic zoology. Part 2 lists the same books by publisher. Price of book and address of publisher usually are stated. There is also an author index. It is worth noting that Stoddard's classic, "The Bobwhite Quail," is still in print, as are most other important wildlife books. In general, the list in this pamphlet is fairly inclusive, but Durward Allen's "Our Wildlife Legacy" and its publisher, Funk & Wagnalls, are omitted.

Gabrielson, Ira N. (Rt. 1, Box 349, Oakton, Va.) IN MEMORIAM: STANLEY GORDON JEWETT. Auk 73(4): 513-516, portrait. Oct. 1956.

Iowa. PUBLICATIONS OF THE IOWA COOPERATIVE WILDLIFE AND FISHERIES RESEARCH UNITS. Dept. Zool. & Ent., Iowa State Coll. 45 p., mimeo. Jan. 1957.
Cites hundreds of papers, 1932-56, by scores of authors. Arrangement is by subject.

PLANTS--GENERAL, ECOLOGY, TECHNIQUES

Bliss, L. C. (Bowling Green State U., Ohio.) A COMPARISON OF PLANT DEVELOPMENT IN MICROENVIRONMENTS OF ARCTIC AND ALPINE TUNDRAS. Ecol. Monog. 26(4): 303-337, 11 figs. Oct. 1956.
Detailed study of areas in n. Alaska and mts. of Wyo.

PLANTS--FLORAS, COMMUNITIES, TAXONOMY

Aller, Alvin R. (NW. Nazarene Coll., Nampa, Idaho.) A TAXONOMIC AND ECOLOGIC STUDY OF THE FLORA OF MONUMENT PEAK, OREGON. Am. Midl. Nat. 56(2): 454-472, 7 figs. Oct. 1956.
Plant communities, successions, life zones, floral affinities.

Booth, W. E. FLORA OF MONTANA. PART I. CONIFERS AND MONOCOTS. Res. Found., Mont. State Coll. 1-232 p., 83 figs. 1950.
Keys, glossary, descriptions, and illustrations of many species make this a useful flora. Keys are brief and simple. Descriptions run about 5-12 lines each and include notes on habitat and distribution in state. Illustrations are predominately pen-and-ink drawings. The 83 "figures" include hundreds of drawings; many figures include illustrations of several species.

Campbell, R. B. TREES OF IOWA. Iowa Agr. Exp. Sta. (Ames), Bul. P121. 62 p., illus. 1956. 60¢. [From J. For. 55(2).]

McDonough, Walter T., and Murray F. Buell. (Rutgers U.) THE VEGETATION OF VOORHEES STATE PARK, NEW JERSEY. Am. Midl. Nat. 56(2): 473-490, 5 figs. Oct. 1956.
Present vegetation, successions, and recommendation for managing vegetation by selective herbicidal treatment to maintain good variety of ecological types and wildlife habitats in the park.

McKean, William T., editor. WINTER GUIDE TO NATIVE SHRUBS OF THE CENTRAL ROCKY MOUNTAINS / WITH SUMMER KEY. Colo. Dept. Game & Fish. xi + 273 p., illus., cloth. 1956.
This bound book, slightly smaller than a Peterson field guide, should be extremely useful to range technicians in the central Rocky Mtn. region. It was prepared by men of U. S. For. Serv. and Colo. Dept. Game & Fish. It is a guide to 107 woody species (75 genera) that have or may appear to have value as food or cover for wildlife or livestock. There is a winter key to genera, a summer key to genera, and there are keys to species of some groups. Species accounts state recognition characters concisely and tell briefly where a plant grows and what its importance is. Each account of a species or group is accompanied by a facing page of drawings or photographs. Much attention, of course, is given to buds, leaf scars and other points vital to identification in winter. Glossary and index facilitate use of the book.

West, Erdman, and Lillian E. Arnold. THE NATIVE TREES OF FLORIDA. Revised edition. U. Fla. Press. 218 p., illus. 1956. $2.00. [From review by R. B. Smith, J. For. 55(3).]
New edition of standard manual. Text has been improved and brought to date and 20 illustrations have been replaced. A workable key precedes descriptions. "This manual has proved valuable in teaching dendrology and should prove a valuable tool in the hands of the forester and botanist working in Florida."

PLANTS--FOREST SURVEYS

Armstrong, George R., and John C. Bjorkbom. THE TIMBER RESOURCES OF NEW YORK. US For. Serv., NE. For. Exp. Sta. (Upper Darby, Pa.). vi + 37 p., 26 figs. + colored type map. Dec. 1956.
Well-printed bulletin that discusses importance of the state's forests and gives data on uses and consumption of wood, present supply, condition and ownership, growth and drain, and what needs to be done. Today nearly half the state's land area is in forest. Net annual growth is more than twice the annual cut. But much of the growth is on small or poorly formed trees of low-value species. Rate of removal of favored species, sizes, and grades exceeds the rate of replacement. Better management and research on a number of topics are much needed.

Division of Forest Economics. FOREST STATISTICS FOR THE ALLEGHENY SECTION OF PENNSYLVANIA. US For. Serv., NE. For. Exp. Sta. (Upper Darby, Pa.), For. Stat. Ser., Pa. no. 8. ii + 16 p., 1 map. 1956.
Area, ownership, and timber-volume data for Warren, McKean, Forest, Elk, Clarion, Jefferson, and Clearfield counties.

PLANTS--FOREST SURVEYS--Continued

Larson, Robert W. THE TIMBER SUPPLY SITUATION IN GEORGIA. US Dept. Agr., For. Resource Rep. no. 12. iii + 51 p., 42 figs. + folding type map. 1956. 55¢ from Supt. Documents.

65% of the land is in forests and more probably will be, as farmland is still being abandoned faster than it is being cleared. About 66% of forest is pine; 80% or more could be. The sawtimber crop is worth more than twice as much per year as the pulpwood crop, but its harvest is accompanied by much destructive exploitation. Commercially usable sawtimber such as pine, gum, and tulip is scarce and decreasing rapidly. Low-quality hardwoods such as oaks are increasing. Young trees, both pines and hardwoods, are increasing. Much land formerly in pine and good hardwoods is being taken over by cull and low-quality hardwoods because of cutting practices, repeated fires, and poor turpentining practices. A fourth of the forest area is poorly stocked and only about half is fully stocked. Much of this stocking is with small hardwoods of poor quality. Progress is being made in fire control and in better forestry and turpentining practices, but a great deal remains to be accomplished in these directions, especially on the many small holdings.

Sternitzke, Herbert S., and John A. Putnam. FORESTS OF THE MISSISSIPPI DELTA. US For. Serv., S. For. Exp. Sta. (New Orleans, La.), For. Surv. Rel. 78. 1-42 p., 6 figs. Oct. 1956.

Text and tables report on the 28 million-acre Miss. floodplain region of Ark., Miss., and La. The region is one of fast-growing hardwoods and still has much extremely valuable timber although most of the old growth is gone. Timbered area is still shrinking. Stocking has improved since the 1930s but annual increment is still far below capacity in both quantity and quality. In fact, present growth is not over a third of the potential in volume and probably not over a sixth in utility and value. Nevertheless, the resource is still substantial and offers great opportunity for better forest management.

WILDLIFE--BIOTAS, ECOLOGY, NATURAL HISTORY

Eklund, Carl R. (US F&WS, Atlanta, Ga.) BIRD AND MAMMAL NOTES FROM THE INTERIOR UNGAVA PENINSULA. Can. Field-Nat. 70(2): 69-76, 1 map. Apr.-June 1956 [Apr. 1957].

Descriptions of observation stations and annotated list. Canada geese comprised 66% of waterfowl observed within the tundra region and 16% within both tundra and forest-tundra. Old-squaw was most common nesting duck in interior tundra and comprised 50% of all ducks seen there. The many willow ptarmigan indicated that 1949 was one of the high years for this species. 1949 was also a high year for the collared lemming. No arctic hares were seen. No caribou were seen in the numerous aerial transect flights, although the area supported a heavy population in the early 1900s. Old antlers were seen and also many of the rock structures built by Eskimo to divert caribou in hunting.--L. F. Stickel.

Savile, D. B. O. (Sci. Serv., Ottawa, Ont.) KNOWN DISPERSAL RATES AND MIGRATORY POTENTIALS AS CLUES TO THE ORIGIN OF THE NORTH AMERICAN BIOTA. Am. Midl. Nat. 56(2): 434-453. Oct. 1956.

Wolfson (Am. Midl. Nat. 53: 353-380, 1955) interpreted the N. Am. bird fauna in line with the hypothesis of continental drift. The present paper, a rebuttal of Wolfson's, marshals an impressive body of evidence favoring permanence of continents. Data pertain to bird migration; ocean passages by land birds; origin of migration over sea barriers; water barriers in relation to dispersal of land animals; rates of spread of introduced species; rates and methods of plant dispersal; and present and past distributions of birds, mammals, and plants.

WILDLIFE--NATURAL AREAS & REFUGES

Branch of Wildlife Refuges. 1957 ADDRESS LIST OF REFUGE MANAGERS. US F&WS, Leafl. WL 382. 8 p. Mar. 1957.

Committee on Standards, Natl. Conf. on State Parks. STATE PARK POLICY SUGGESTIONS. Minn. Nat. 7(4): 66-68. Dec. 1956.

Parks contain 2 basically different types of areas: those developed for public use and those dedicated to preservation of natural conditions. Policies and techniques that should be applied to management of each type are listed. As to wildlife: native animals should be maintained or restored insofar as feasible, with regard for surrounding lands and their uses; mammals that can dominate vegetation should be kept at levels that will permit preservation of a normal assemblage of plants. "The park administration should be free to accept or reject offers of contributed labor in wildlife reduction programs exactly as in other aspects of park operation. The aquatic environment and its inhabitants should be regarded as an integral part of State Parks and managed in conformity with general practices governing these areas."

Duncan, D. P. (U. Minn.) MANAGEMENT OF MINNESOTA STATE PARK FORESTS. Minn. Nat. 7(4): 60-63, 1 photo. Dec. 1956.

One function of a state park is to preserve strictly natural areas. Another is to provide recreational facilities and the opportunity to see large old pine stands, wild flowers, autumn colors, and a good variety of animals and plants in some abundance and under something like natural conditions. These functions are incompatible. The best solution seems to be zoning, with some tracts of 40 to 640 acres (in Itasca) kept as natural as possible and allowed to undergo succession to climax. Other portions would be managed skilfully and inconspicuously to maintain pine stands, thickets of sumac and paper birch, and aspen stands for beaver use. Planting and vegetation control of various kinds would be used for these purposes and to reduce undesirable brush and to salvage down timber. Also, excessive deer populations would have to be controlled.

Smith, Alden E. NATURAL AREA PARKS FOR YOUR COMMUNITY. Va. Wildl. 18(1): 12-13, 20-21, 3 photos. Jan. 1957.

Tells how rapidly the natural areas of our nation are being destroyed, why these areas are important and valuable, and how individuals and groups can go about getting such areas preserved for local use as well as scientific study. A closely related article in the same issue is "Keeping the face of America beautiful--a problem in land use patterns," by Richard H. Pough.

WILDLIFE--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Cochran, Rod. (Ohio Div. Wildl.) ARE WE CHANGING OUR WILDLIFE? Ohio Cons. Bul. 20(11): 4-5, 32, 1 photo. Nov. 1956.

Evidence that hunting is causing selection for quail and pheasants that run or even take to mammal burrows instead of flushing, and for cottontails that den by day and feed at night and take to burrows instead of running.

WILDLIFE--EFFECTS OF CHEMICALS, WEATHER, CARS, ETC.

Cottam, Clarence. (Welder Wildl. Found., Sinton, Texas.) CHEMICAL CONTROLS IN RELATION TO WILDLIFE. PART 1. Va. Wildl. 17(10): 12-13, 22-23, 3 photos. Oct. 1956.

A review of effects of modern insecticides on fish and wildlife. Some excellent, concrete examples are described.

DeWitt, James B. (Patuxent Refuge, Laurel, Md.) CHRONIC TOXICITY TO QUAIL AND PHEASANTS OF SOME CHLORINATED INSECTICIDES. Agr. & Food Chem. 4(10): 863-866. Oct. 1956.

Quantitative report of tests. Author's abstract: "Inclusion of 1 p.p.m. of aldrin, dieldrin, or endrin in diets fed growing quail resulted in high mortality rates, but the birds survived on diets containing 100 p.p.m. of DDT or 50 p.p.m. of strobane. Young pheasants survived on diets containing 50 p.p.m. of DDT or strobane, but failed to survive on diets containing 5 p.p.m. of aldrin, dieldrin, or endrin. No ill effects were noted when quail were fed winter diets containing 50 p.p.m. of strobane, or 1 p.p.m. of dieldrin or endrin, but nearly all birds died when fed diets containing 0.5 p.p.m. of aldrin. Mortality rates among pheasants fed 50 p.p.m. and of quail fed 100 p.p.m. of DDT were higher than for

birds receiving normal diets, but none of the birds displayed symptoms characteristic of DDT poisoning. Egg production, fertility, and hatchability were relatively unaffected by inclusion of insecticides in diets fed breeding quail, but chicks from these matings showed high mortality rates even when reared on insecticide-free diets. Lowered viability of quail chicks was most pronounced in groups receiving DDT and strobane in the reproduction diets. Hatchability of pheasant eggs and viability of chicks were adversely affected by inclusion of aldrin, dieldrin, or endrin in the reproduction diets."

Genelly, Richard E., and Robert L. Rudd. (U. Calif., Davis.) EFFECTS OF DDT, TOXAPHENE, AND DIELDRIN ON PHEASANT REPRODUCTION. Auk 73(4): 529-539, 4 graphs. Oct. 1956.

From summary: "Egg production was depressed significantly in the groups fed 300 p.p.m. of toxaphene and either 25 p.p.m. or 50 p.p.m. of dieldrin. There appeared to be a direct correlation between food consumption and egg production in all groups. Egg fertility of the 50 p.p.m. dieldrin group and the hatchability of the eggs from the 300 p.p.m. toxaphene group were significantly lower than in the control. The lowered hatchability was associated with poor condition of the adult females rather than with the concentration of the insecticides within the eggs. Mortality of young in each test group was significantly greater than that of controls for the first two weeks. From the second through the eighth week of age, survival of young did not differ appreciably between test and control groups. Reproductive success ranged from 70 per cent in the control group to 38 per cent in the 50 p.p.m. dieldrin group. The higher concentration of each chemical had the greater net effect on reproduction. Evidence of the relative importance of reproductive effects in reducing wild bird populations is lacking. However, insecticide levels similar to or in excess of those used in this study are of common occurrence in agricultural areas. Furthermore, wild birds are exposed to a greater contamination hazard, by aerial spraying, than the test birds."

George, J. L., R. F. Darsie, Jr., and P. F. Springer. (Vassar Coll.) EFFECTS ON WILDLIFE OF AERIAL APPLICATIONS OF STROBANE, DDT, AND BHC TO TIDAL MARSHES IN DELAWARE. J. Wildl. Mgt. 21(1): 42-53, 1 map. Jan. 1957.

Four study areas at Bombay Hook Refuge were used. One was a control area; each of the others was treated with 1 of the chemicals. These chemicals, in oil solution, were applied from airplane at rates of 0.1, 0.2, and 0.3 lbs. per acre of BHC (43% gamma isomer), DDT, and Strobane, respectively. Applications were made morning of July 27 and evening of Aug. 23. Various methods were used to appraise results on numerous species of animals. There were no significant differences in mortality of fishes and blue crabs in the 4 plots. "Differential mortalities were suffered by fish caged in streams and ponds. Greater numbers died in the BHC-treated streams and in the DDT-treated ponds. Local concentrations of insecticide appeared to be the cause, although the magnitude of kill was not significantly greater than in control areas. Field observations and crab-pot counts showed that both the fish and blue crabs avoided the sites of high insecticide concentration. Certainly the majority of free-living individuals in the treated areas were able to survive the sprays, and at the level tested showed no acute toxicity from single applications." Marsh fiddler crabs, Uca pugnax, were most affected; mortalities of 68-80% were sustained as against 16% for controls. Greatest losses were in BHC area. This crab is important as a dominant crustacean and as food of birds and mammals. Other species of fiddler crabs were less affected. In general, the chemical applications appeared to cause no consequential damage other than that to U. pugnax.

Przygodda, Wilfried. (Nordrhein-Westfälische Vogelschutzwarte Agidiusstrasse 94 (Waldhaus), Essen-Bredeney, Germany.) EFFECTS ON THE BIRD POPULATION OF DIELDRIN USED FOR CONTROL OF MAY BEETLES AND ACTION OF FORTIFIED PARATHION ON NESTLING BIRDS. Ornith. Mitteilungen 9: 67-78, 4 graphs. 1957.

In German. Detailed research report.

WILDLIFE--PARASITES & DISEASES

Choquette, L. P. E. (Parasit. Lab., 1570 St. Hubert St., Montreal, P. Q.) SIGNIFICANCE OF PARASITES IN WILDLIFE. Can. J. Comp. Med. & Vet. Sci. 20(11): 418-426. Nov. 1956.

Factual review paper with numerous examples. 26 references are cited.

Odlaug, Theron O. (U. Minn., Duluth.) HELMINTH PARASITES REPORTED FROM VERTEBRATES IN MINNESOTA. Flicker 28(4): 138-148. Dec. 1956.

Helminths of fishes, amphibians, reptiles, and mammals are listed by species of host with notes on site in body, known localities of occurrence, and authority for record. Bibliography of 4 p. [Note that helminths of birds are not treated in this paper; they were covered in Flicker 26(2): 59-65, June 1954.]

WILDLIFE--POPULATIONS & FLUCTUATIONS

Siivonen, Lauri. (Finnish Game Found., Helsinki.) THE CORRELATION BETWEEN THE FLUCTUATIONS OF PARTRIDGE AND EUROPEAN HARE POPULATIONS AND THE CLIMATIC CONDITIONS OF WINTERS IN SOUTH-WEST FINLAND DURING THE LAST THIRTY YEARS. Papers on Game Research (Finnish Game Found., Helsinki) no. 17. 1-30 p., 9 maps, 6 graphs. 1956.

In English. Over the past 30 years in sw. Finland, fluctuations in numbers of partridges (Perdix perdix) and hares (Lepus europaeus) at the hunting season were determined by the amount of snow in the winter preceding the season. Cause was actual loss of breeders and poor condition of survivors. Winter temperatures were generally of secondary importance. Fluctuations in nesting populations of the goldcrest depended primarily on the temperature of the preceding winter. Pheasant populations were affected by both snow and temperature. Short-term fluctuations in hare and partridge numbers probably occurred but were obscured by strong effects of winter weather conditions.--L. F. Stickel.

WILDLIFE--BIOMETRICS

Becker, Walter. AN INVESTIGATION OF THE LOG TRANSFORMATION OF GROWTH DATA. Biometrics 12(4): 536. Dec. 1956. (Abstract only.)--V. Schultz.

Brian, M. V. (Nat. Conservancy, Furzebrook Res. Sta., Eng.) EXPLOITATION AND INTERFERENCE IN INTERSPECIES COMPETITION. J. Anim. Ecol. 25(2): 339-347, 2 graphs. Nov. 1956.

Author's summary: "The analysis of interspecies competition into two components, exploitation and interference, is examined from a theoretical point of view. It is suggested that two deterministic models exist which represent one or the other of these in pure form. A stochastic model of the exploitation type is described."

Gilbert, N. E. G. (John Innes Horticultural Inst.) LIKELIHOOD FUNCTION FOR CAPTURE-RECAPTURE SAMPLES. Biometrika 43(3/4): 488-489. Dec. 1956.

"This note describes a simple way of correcting the error which is introduced when the binomial distribution is used instead of the hypergeometric."--V. Schultz.

Tester, Albert L. ESTIMATION OF RECRUITMENT AND NATURAL MORTALITY RATE FROM AGE-COMPOSITION AND CATCH DATA IN BRITISH COLUMBIA HERRING POPULATIONS. J. Fish. Res. Bd. Canada 12(5): 649-681. 1955. [From long abstract by author in Sport Fishery Abstracts 2(1).]

WILDLIFE--TECHNIQUES

Gysel, Leslie W., and Earle M. Davis, Jr. (Mich. State U.) A SIMPLE AUTOMATIC PHOTOGRAPHIC UNIT FOR WILDLIFE RESEARCH. J. Wildl. Mgt. 20(4): 451-453, 3 figs. Oct. 1956.

The unit consists of an inexpensive camera with a synchronized flash attachment and a simple electrically operated device for releasing the shutter. This shutter-releasing mechanism consists of a solenoid, a spring-driven wire, two knife switches, and a dry-cell battery. Only a very light pull on a short,

baited string is required to release the shutter. This unit functioned well during all seasons in Mich. It was used to determine the species of animals taking seed and animal baits and utilizing ground dens.--L. W. Gysel.

Höglund, Nils H. SWEDISH SPORTMEN'S ASSOCIATION'S MARKING OF GAME 1945-1954. Viltrevy (Stockholm) 1(2): 162-224, 3 photos. Nov. 1956.

Marking methods for birds and mammals are described and illustrated and data on recoveries of a wide variety of birds and mammals are tabulated. Birds are marked mostly with wing tags because these tags can be applied to newly hatched young without causing injury and remain in place indefinitely. "For mammals a special marking device is employed consisting of a button for fixing in one ear. The mark consists of a metal plate of 14 mm diameter rivetted to a 17 mm long pointed pin which can be pressed into a domed button head. Between the upper and lower sides of the domed head a steel disk is inserted, which is provided with a cut-out cross with edges turned inwards, so that the pin cannot be removed once it has been pressed through the cross into the hole of the button head. The metal plate is stamped with the return address."

Howard, Edwin J., and John C. Marchant. (Miami U., Oxford, Ohio.) A FAST ELECTRONIC EYE FOR BIRD PHOTOGRAPHY. Aud. Mag. 58(6): 278-283, 291, 13 figs. Nov.-Dec. 1956.

"The electronic eye described...can be used to trip the shutter of a camera attached to an ordinary flash gun; an electronic or 'speed' flash outfit; or no lights at all. But for good pictures of small birds in flight close to the camera, electronic flash is practically a necessity." The electronic eye invented by the authors has time lag of virtually zero and can be built by nearly anyone from standard parts available at electronics supply houses.

Hungerford, Kenneth E. (U. Idaho.) A PORTABLE INSTRUMENT SHELTER FOR ECOLOGICAL STUDIES. Ecol. 38(1): 150-151, 1 photo. Jan. 1957.

Kelker, George Hills. (Utah State Agr. Coll.) RESEARCH METHODS FOR THE BEGINNER / A MANUAL FOR THE OUTDOOR BIOLOGIST ON PROCEDURES IN PLANNING, PERFORMING, ANALYZING, AND WRITING THE RESULTS OF AN INVESTIGATION. Utah State Agr. Coll. viii + 103 p. Oct. 1956.

The objectives of this manual are to train junior classmen majoring in wildlife management in the elements of planning research and writing scientific reports. It contains sections on choosing a research problem, use of the literature, methods of obtaining information, the recording of data, experimental design, methods of presenting data, statistics, thesis writing, logic, the scientific method, wildlife research needs, and other topics. This material is very general in scope and is organized into 34 lessons. Much helpful information is compiled, but unfortunately it is not well organized and is diluted with material of little value and is occasionally misleading. The emphasis in some sections is questionable. In general, there is inadequate mention of suitable reference material.--A. D. Geis.

Larimore, R. Weldon. (Ill. Nat. Hist. Surv., Urbana.) A MARGINAL-DOT SYSTEM OF INDEXING REFERENCE CARDS. J. Wildl. Mgt. 21(1): 92-94, 1 fig. Jan. 1957.

Reference cards are indexed by subject by marking positions on the edges of each card to correspond to various subject categories. Each position is assigned one of a series of contrasting colors to aid in distinguishing adjacent positions when the cards are filed. Although the system is not suitable for a reference catalog requiring several hundred or more subject categories, it does provide an index to the author and more than one hundred subject categories on a single reference card. The cards are quickly indexed and references are quickly selected from the file, with only cards that are applicable being removed. No special cards or equipment are necessary, and an established card file may be indexed with this system.--Author.

Lemmon, Paul E. (US Soil Cons. Serv., Portland, Ore.) A SPHERICAL DENSIOMETER FOR ESTIMATING FOREST OVERSTORY DENSITY. For. Sci. 2(4): 314-320, 5 figs. Dec. 1956.

Moessner, Karl E. AERIAL PHOTO SCALE-PROTRACTORS FOR MOUNTAINOUS AREAS. US For. Serv., Intermtn. For. & Range Exp. Sta. (Ogden, Utah), Res. Note no. 40. 7 p., 5 figs. Dec. 1956.

Pendleton, Robert C. (Biol. Sect., Gen. Electric Co., Richland, Wash.) USES OF MARKING ANIMALS IN ECOLOGICAL STUDIES: LABELING ANIMALS WITH RADIOISOTOPES. Ecol. 37(4): 686-689. Oct. 1956.

Suggests numerous ways in which these methods could be used in a wide variety of problems. Many of the references are in sources with which few wildlife biologists are familiar.

Spector, William S., editor. HANDBOOK OF BIOLOGICAL DATA. US Air Force, Wright-Patterson Air Force Base, Ohio. WADC Tech. Rep. 56-273. xxxvi + 584 p., illus. Oct. 1956. Published under same title by W. B. Saunders Company, Philadelphia, Oct. 1956.

Unprecedented encyclopedia of biological data, largely tabular. Subsidized by defense agencies and supervised by National Academy of Sciences-National Research Council, this volume lists 4,000 contributors and 13,000 consultants and reviewers. Its large pages and small print contain an enormous amount of information on an amazing range of topics from biophysics through natural history, including much biochemistry, genetics, and anatomy. These are accessible through table of contents, index, and index to persons responsible for contributing and reviewing given sections. Great effort was made to achieve maximum reliability, but almost any specialist will find some figures or statements he can question. Wherever possible, data are given on level of species, and ranges are stated for variations. A few topics of interest to wildlife biologists may be listed: characteristics of vitamins, composition of milk, composition of blood, digestive fluids, composition of tissues, composition of seeds, breeding habits of mammals, nesting behavior of birds, nesting success, breeding habits of animal groups, biology of reproduction, values in mammalian reproduction, growth of vertebrate animals, tooth development of mammals, surface-area relationships of mammals, life spans of animals and plants, nutrients, diets for animals of many kinds, feed utilization by vertebrates, metabolism of various substances by animals, respiration rates, cardiac output of animals, water balance of animals, body temperatures, hibernation, characteristics of herbicides, characteristics of rodenticides and insecticides, treatment of poisonings, animal venoms, shade tolerance of plants, radioisotopes, parasites and diseases, human population data, and animal sex ratios. There are also classifications of animals and plants, conversion tables, constants, and other useful aids.

Sugden, Lawson G. (B. C. Game Dept., Williams Lake.) A TECHNIQUE FOR CLOSING GATES ON BIG-GAME LIVE TRAPS BY REMOTE CONTROL. J. Wildl. Mgt. 20(4): 467, 3 photos. Oct. 1956.

A description of the use of detonating caps for severing suspension ropes on gates of live traps is given. Caps were connected by wires to a blasting machine.--Author.

Thorne, Oakleigh, II. A SOLENOID MECHANISM FOR SPRINGING BIRD TRAPS. Thorne Ecol. Res. Sta. (Boulder, Colo.), Bul. no. 4. 1-6 p., 5 figs. Jan. 1957.

"An electrical method for springing non-automatic bird traps is considerably more quick and efficient than the conventional pull-string method. By means of a simple solenoid, a long-lasting trip mechanism can be constructed. This bulletin will describe such a one that has been in use by the author since 1949, and proved extremely successful... In eight years, the author has never had one fail!"

Wallen, A. F. (Hammon, Hensen & Wallen, Mapping & For. Services, Oakland, Calif.) WET WEATHER TIP. J. For. 55(3): 212. Mar. 1957.

Taking notes or filling out forms is often troublesome in wet weather. "Recently when confronted with this problem a test was made with Keuffel and Esser Co. Stabilene Film, Helios dry developing black line Scribe Coat (thickness .0075 inches). This is a sensitized material used for topographic map reproduction. Several of the necessary forms are either typed or drafted on a sheet of tracing cloth or paper. The tracing and the Scribe Coat is then run through an Ozalid machine to print the forms. The emulsion side of Scribe Coat has a surface ideal for pencil. The forms can be easily cleaned by a hard rubbing with a wet rag." [Copied almost completely.]

WILDLIFE--MANAGEMENT & RESEARCH, GENERAL

Hickie, Paul. (1250 W. Pecan St., Stephenville, Texas.) THE APPLICATION OF ECOLOGY TO WILDLIFE MANAGEMENT. Ecol. 38(1): 53-56. Jan. 1957.

Historical effects of ecological changes on wildlife, examples of effective management based on ecological investigations, and discussion of ecological problems and research needs of the wildlife manager.--L. F. Stickel.

Pepper, J. H. (Mont. State Coll.) SOME PROBLEMS INVOLVED IN RESEARCH AND EDUCATION IN GAME MANAGEMENT. S. Dak. Cons. Digest 24(4): 4-6, 1 photo. Apr. 1957.

The author urges that wildlife research biologists be selected on the basis of their ability to do good research and that their duties not include public relations work. He urges that the education and public relations personnel be selected with equal care, in line with their duties, and that they be given sufficient contact with research biologists to fully understand and appreciate the wildlife management program they are selling.

Schulze, Herman. DER WAIDGERECHTE JÄGER. 13th edition. Verlag Paul Parey, Hamburg & Berlin. 132 p., 88 illus. 1955. [From review by C. H. D. Clarke, J. Wildl. Mgt. 21(1).]

"...has always been a handbook of the things a hunter has to know if he aspires to be classified as a 'Sportsman,' ... rather than as a mere hunter. The book has now acquired an importance it never had before because the new West German Hunting Law...provides, for the first time, for a hunting license dependent on an examination. The hunter must show a satisfactory knowledge of all the shootable animals, including identification, basic life history, sexing and aging, tracking, traditional terminology, and trophies. He must also show that he can handle firearms and take proper care of the game he has killed; and he must know his game law. Put in our terms, the man who doesn't know a red-tailed hawk from a goshawk, or can't gut a deer properly, cannot get a license. The old manual now becomes a textbook on which the examiner's questions may be based... The conservation part includes bits on how to select the type of animals to be shot, wildlife diseases, feeding and coverts, prevention of game damage, protection from predators (with a stern reminder of unqualified responsibility to conform to the ethics of nature protection)...and finally, the Manifest or Code of Ethics of the German Hunters' Association. If they all live up to it, one would surely enjoy shooting with them... One suspects that the purpose of the new law is to try to force steps towards perfection that were never taken voluntarily. The 'Code' is an essay in itself, but apparently both practical sportsmanship and game management are most securely established when they form a part of a ritual that may also embrace, on an equal footing, such things as fancy pants, horn music, and the dead deer's 'last bite.'"

Wetzel, John H. (US Soil Cons. Serv.) OPPORTUNITIES UNDER THE WATERSHED PROGRAM. Proc. NE. Sec. Wildl. Soc. et al. 1-12 p., mimeo. Jan. 1957.

A full, clear explanation of how the watershed program operates and what it can do. It tells how plans must originate with local groups and just how and to what extent the federal government will participate. Fish and wildlife improvements themselves must be financed through PR, DJ, or other wildlife funds. [Early participation by wildlife men in planning each project is vital not only for realization of full wildlife potentials but for attempting to alter drainage features that have made a number of watershed projects highly injurious to wildlife interests.]

WILDLIFE--HUNTING AREAS & PROBLEMS

Rice, Alfred W. (La Crosse Tribune, La Crosse, Wis.) A BIG STEP FORWARD. Wis. Cons. Bul. 21(10): 3-6. Oct. 1956.

Organized farmers and organized sportsmen of La Crosse Co. held a series of parleys about their mutual problems. The statements of policy and recommendations that resulted are reported in detail. They should be of interest to those concerned with promoting good hunter-farmer relationships.

WILDLIFE--INTRODUCTIONS

de Vos, Antoon, R. H. Manville, and R. G. Van Gelder. (Ont. Agr. Coll., Guelph.) INTRODUCED MAMMALS AND THEIR INFLUENCE ON NATIVE BIOTA. Zoologica 41(4): 163-194, 1 map. Dec. 1956.

Important, detailed reference. It lists and discusses, area by area, mammals that have been introduced in all parts of the world. Information is based on both publications and personal communications; much of it is unfamiliar. More than 200 species of mammals have been moved about the globe, often with disastrous results. We are still peddling over the U. S. such noted pests as European rabbits and nutrias. Golden hamsters already have become established in the wild in parts of Germany. The authors stress the fact that results of an introduction depend on many factors and are unpredictable. An exotic may destroy vegetation and cause soil erosion; it may eliminate native animals or cause serious genetic changes in them; it may change its habits and become a pest; it may bring in parasites and diseases. Examples of all these are given. A habitat can support only so much animal life; only rarely will an exotic increase the total supply of game. Extermination of an established exotic is difficult, nearly impossible; there is only 1 known instance of an exotic being removed from a relatively large area. Introduction of mammals is hazardous. Further introductions should be made only after approval by an international board of experts. "The introduction of a mammal for the sole purpose of controlling pests is almost certainly doomed to failure. Food habits are rarely so specialized that a mammal will feed entirely on the pest to be controlled. Few mammals introduced for sport have proved eminently successful." Selected bibliography of 5 pages.

Halloran, Arthur F., and Julian A. Howard. (US F&WS, Cache, Okla.) ARANSAS REFUGE WILDLIFE INTRODUCTIONS. J. Wildl. Mgt. 20(4): 460-461. Oct. 1956.

A history of introductions of exotic game and reintroductions of native game for the period 1925 to 1935 is given for the Blackjack (St. Charles) Peninsula on the central Texas coast on land that is now the Aransas Nat. Wildl. Refuge. Reintroduced white-tailed deer, Rio Grande turkey, and mixed-ancestry European wild boars have persisted and increased. Fallow deer (some of which were removed), mule deer, Calif. quail, and ring-necked pheasants were not successful. --Authors.

Levi, Herbert W. (Mus. Comp. Zool., Harvard U.) BIBLIOGRAPHY ON INTRODUCED OR TRANSPLANTED ANIMALS / ADDITIONS MAY 1956. 6 p., mimeo. 1956.

List of about 110 titles, most of which pertain to game and fish in America. Supplements earlier lists by author.

WILDLIFE--ECONOMIC & OTHER VALUES

Alabama. ALABAMA HUNTING AND FISHING ARE BIG BUSINESS. Ala. Dept. Cons. 28 unnumbered p., illus. 1956.

Crossley S-D Surveys' report on hunting and fishing in Ala. in 1955. 562,000 Ala. people 12 years or older hunted, spending $48,869,000. 44% of households had at least one fisherman or hunter; 486,000 people fished, 249,000 hunted. Av. expenditure per fisherman was over $74.53, per hunter, over $50.80. There was a higher proportion of fishermen in rural communities and small cities than large cities. Rural areas had a higher proportion of hunters than small or large cities.--L. F. Stickel.

Iowa. THE IOWA HUNTING AND FISHING SURVEY--1955. Iowa Cons. 15(11): suppl. paged 1-7, illus. Nov. 1956.

Report of a special state economic survey made by Crossley S-D Surveys Inc. when making national survey. Among many findings expressed in tables, graphs, and text are the following: Nearly half (48.9%) of households had at least one hunter or fisherman. Of 359,000 Iowans hunting in 1955, 355,000 hunted small game, 9,000 big game, and 72,000 waterfowl. 82.7% of hunters were licensed. Totals spent were $28,498,000 for fishing and $13,909,000 for hunting. Av. expenditure for hunters of 12 years of age or more was $38.74. Hunters' largest costs were for equipment and transportation. The av. hunter spent $19.17 on equipment. $2,154,000 was spent on dogs and care of them. Pheasant was preferred game of 59% of hunters, cottontail of 13.4%, squirrel of 9.2%, and

waterfowl of 8.1%. Red fox was surprisingly popular game: it was hunted by 10.6% of hunters, was preferred game of 2.8%, and accounted for 7.9% of all hunting trips. Figures for raccoon differ only slightly from those for red fox.

Maryland. SURVEY OF MARYLAND HUNTERS AND FISHERMAN. Md. Game & Inland Fish Comm., Fed. Aid Proj. FW-1-R-1. iii + 17 p. + 17 p. tables, mimeo. Nov. 1956.

Detailed, mimeographed report of the Crossley survey. For some of the findings, see entry "330,000 Maryland sportsmen spend 28 million."

Maryland. 330,000 MARYLAND SPORTSMEN SPEND 28 MILLION. Md. Cons. 34(1): 21-22. Jan. 1957.

Report of the study made by Crossley S-D Surveys in Md. Thirty percent of Md. households have at least 1 hunter or fisherman. 109,000 hunted small game, 40,000 big game, and 17,000 waterfowl. Av. expenditure per hunter was $71.06, about the same as per fisherman. Largest cost was for equipment, $28.67. "The breakdown showed that 2,593,000 days were spent for fresh water fishing, 1,951,000 for salt water, 177,000 for big game hunting, 1,187,000 for small game, and 264,000 for waterfowl. A total of 169,775,000 passenger miles were traveled by hunters and fishermen..."

Miller, Townsend. (Texas Game Comm.) THE IMPACT OF HUNTING AND FISHING IN TEXAS. Texas Game & Fish 15(1): 10-11. Jan. 1957.

Brief report of the Crossley economic survey in Texas. Hunters and fishermen spent $165 million for their sport in 1955. $42,135,000 was spent for hunting. More was spent on hunting and fishing than on medical and dental care and hospitalization insurance combined. The average hunter spent $59.43, hunted 13 days on 11 trips, and drove 666 miles.

Nicholson, A. J. SUMMARY OF SPORTSMEN'S EXPENDITURES, MISSOURI RIVER BASIN. US F&WS, Spec. Sci. Rep.: Wildl. no. 35. ii + 15 p., + 2 folding tables. Mar. 1957.

Summarizes results of 45 sportsmen-expenditure studies made 1947-54. Expenditures on different items, and estimated cost per pound of fish or unit of game, are shown for each study area. Transportation usually was about 50% of daily expense. Trout fishermen spent nearly twice as much per day as warm-water fishermen. Pheasant hunters spent the least per day of all hunters. Duck hunters spent 1.5 times as much, deer hunters 2.5 times as much, and elk hunters 4 times as much.

Tennessee. HOW BIG ARE THE SPORTS OF HUNTING AND FISHING IN TENNESSEE? Tenn. Game & Fish Comm., Final Rep. FW-1-R-1. 1-sheet folder. No date. Rec'd. Jan. 1957.

Report of special Tenn. survey made by Crossley S-D Surveys in connection with national survey of hunting and fishing in 1955. Four in every 10 households had at least 1 person who hunter or fished. One out of 3 men and 1 out of 8 women went fishing. One out of 4 men and 1 out of 99 women went hunting. 98% hunted small game, 13% waterfowl, and 2% big game. Hunters and fishermen spent $60,267,000 for their sport, an av. of $94. Only 2% went for state and federal permits; 98% went to Tenn. businesses. The sum was approximately equal to income from tobacco or dairy products. "And all of this income is just a by-product of the 6.7 million days of healthful, relaxing pleasure for which the people hunted and fished."

Utah. $44 MILLION SPENT IN UTAH ON HUNTING AND FISHING IN A YEAR. Utah Fish & Game Bul. 13(4): 5-7, 3 graphs. Apr. 1957.

Survey by the Bureau of Economic & Business Research, U. Utah, showed $44 million spent in 1955, $41 million by residents. Av. individual expenditure was $222. Deer hunting was the preferred sport; stream fishing, lake fishing, pheasant shooting, and duck shooting followed in that order.--L. F. Stickel.

WILDLIFE--PREDATION, CROP DAMAGE, CONTROL

Titus, Harold. WHAT GOOD ARE BOUNTIES? Field & Stream 61(11): 53-55, 132-134, 3 photos. Mar. 1957.
In preparing this general article on the questionable value of bounties, Titus sought data from game administrators of each state. He found that bounties are paid in all or parts of 35 states. Game funds pay all or a portion of the cost in 17 states. Authorities of 24 states said that bounties were not worth the cost. Authorities of only 4 states said that bounties were worth the cost--at least at times. Nationwide, total cost in nearly $2 million a year. Author reports sad experiences some states have had with bounties and quotes several opinions. He also discusses the alternatives: paid-hunter system and extension-trapper system.

WILDLIFE--REPORTS OF ORGANIZATIONS & REPORTS OF HARVESTS

Alabama. DEPARTMENT OF CONSERVATION...REPORT FOR FISCAL YEAR OCTOBER 1, 1954 - SEPTEMBER 30, 1955. 232 p., illus. 1956.
Report of the Division of Game & Fish occupies pages 91-190 and contains summaries of numerous projects. It outlines status of the major types of game and reports on stocking of quail and pheasant. PR projects summarized include: study of quail feeders; work done on farm, forest, and waterfowl management areas; study of gray squirrel sex and age ratios and hunting statistics; studies of past and present turkey distribution and study of utilization of food plots made for turkeys; mast production; road counts and hunting results for doves; value of recent fur catch; ages and weights of deer; and waterfowl surveys. Coop. Wildl. Res. Unit investigations of quail, dove, cottontail, waterfowl, deer, and bobcat are also summarized; publications or theses on most of these Unit projects have been recorded previously in WR.

Anon. FEDERAL AID IN FISH AND WILDLIFE RESTORATION / ANNUAL REPORTS OF THE DINGELL-JOHNSON AND PITTMAN-ROBERTSON PROGRAMS FOR THE FISCAL YEAR ENDING JUNE 30, 1956. Wildl. Mgt. Inst. and Sport Fishing Inst., Wash. 5, D. C. 1-106 p., illus. [1957.]
Accomplishments of the wildlife restoration program are reviewed on p. 7-18 under headings of wildlife developments (50% of cost), wildlife investigations (26% of cost), and acquisition of wildlife lands (16% of cost). Projects and costs are listed by state on p. 29-99. Tables give data on finances and on land purchases approved in each state during the year.--L. F. Stickel.

British Columbia. PROVINCIAL GAME COMMISSION REPORT FOR THE YEAR ENDED DECEMBER 31ST 1955. 1-99 p. 1956.
Reports from the 5 districts give data on game status and problems. In general, duck, pheasant and grouse populations declined from the preceding year while mule deer, whitetail deer, and moose populations increased. Game Management Division district reports give data on: browse surveys (range conditions not improving); moose, mule deer, and whitetail deer harvests and age structures; and crop damage by elk and whitetail deer. They also provide further discussion of game populations and problems. Summary tables at the end of the report show pheasant and chukar releases and, by species: pelt harvest 1921-55; bounties, 1922-55; kills of big game, fur animals, and predators, 1955-56.--L. F. Stickel.

Colorado. ANNUAL REPORT / FISCAL YEAR 1955-1956. Colo. Dept. Game & Fish. 1-24 p., 1 photo. [1957?]
Brief resumé of big game problems (adequate harvest, winter forage) and upland game problems (impact of farming practices, public shooting grounds) is followed by the fiscal report. Useful summary pages show game kill and fur catch by species, number of hunters, and population trends by species.--L. F. Stickel.

Farley, John L. [ANNUAL REPORT OF THE] FISH AND WILDLIFE SERVICE. p. 269-298 in 1956 Annual Report of the Secretary of the Interior. xliii + 380 p., illus. [1957.] $1.25 from Supt. Documents.
Brief accounts of some of the activities and accomplishments of all portions of the agency.

Gabrielson, Ira N. REPORT TO THE NEW MEXICO DEPARTMENT OF GAME AND FISH BY THE WILDLIFE MANAGEMENT INSTITUTE 1957. N. M. Wildl. 2(3): 8. Mar. 1957.
Findings and recommendations of the Institute's latest survey of the Department and its needs.

Indiana. ANNUAL REPORT OF THE DIVISION OF FISH AND GAME FOR THE FISCAL YEAR ENDED JUNE 30, 1955. 17 unnumbered p., mimeo. [Rec'd. Mar. 1957]
Financial accounting, list of projects, tabular data on game and fish plantings.

Maryland. THIRTY-NINTH ANNUAL REPORT OF THE DIRECTOR AND EIGHTEENTH ANNUAL REPORT OF THE GAME AND INLAND FISH COMMISSION 1956. Md. Cons. 33(6): 1-32 p., illus. Nov. 1956.
Tabular data are given on game birds propagated and released, game mammals trapped and transferred, and deer harvested. A short summary of game conditions is presented. Concise descriptions are given of work done in farm game management, in wetland survey and management, and in constructing water holes for game in the mountainous part of the state.

Missouri. [TWENTY-YEAR REPORT AND 1955-56 REPORT OF CONSERVATION COMMISSION.] Mo. Cons. 17(11): 1-33, illus. Nov. 1956.
This is not only a report on work and conditions in 1955-56 but also a summary of accomplishments and changes in the 20 years that the Commission has existed. In these 2 decades, sale of permits rose from 252,822 to 811,854; income from $349,746 to $3,409,682; deer kill from about 82 to 8,025; beaver population from 150 to 45,000; kill of ducks from 39,560 to 373,674; kill of geese from 650 to 25,931. State game and forestry lands were greatly increased, as several tables demonstrate. In 1955-56, drought was less and populations and kills of quail, rabbits, squirrels, and doves were good to excellent.

New Hampshire. BIENNIAL REPORT OF THE DEPARTMENT OF FISH AND GAME, JULY 1, 1954 TO JUNE 30, 1956. 1-61 p., illus. [1957?]
A general account of the N. H. program. Includes discussion of deer management by cooperative strip cuttings. Provides tabular data on deer kill and sex ratios, fur animal harvest by species (1954 and 1955), and pheasant stocking. The pheasant propagation program has been increased with construction of additional facilities.--L. F. Stickel.

NORTH DAKOTA GAME AND FISH DEPARTMENT ANNUAL REPORT / JULY 1, 1955 TO JUNE 30, 1956. 1-37 p., illus. [1957?]
The game management program included tree planting for pheasant protection in winter; food plantings on mine-spoil piles, sand blows, and other wasteland; and a plantings-evaluation program. Pheasant season of 1955 was the best in several years, but there was some decline in the 1956 spring pheasant population owing to drouth and winter storm kill. Numbers of sharp-tailed grouse and Hungarian partridge have been increasing. Ruffed grouse have been declining since 1953; hunting has continued on a curtailed basis, except in 1 area where effect of hunting at times of low populations is being studied. Waterfowl production, banding, harvest, and breeding grounds studies are reviewed. Fur animal status is discussed by species; tables give data on fur harvest (1949-55), pelt prices, and bounty payments. Numbers of foxes bountied reached an all time high but the fox population remained high. The section on big game includes data on: population trends, 1952-56; kill and age and sex ratios of mule and whitetail deer; success of deer rest areas; kill and sex and age ratios of pronghorns; and transplanting of pronghorns.--L. F. Stickel.

North Dakota. SUMMARY OF ACTIVITIES--1956. N. Dak. Outdoors 19(7): 3-18, illus. Jan. 1957.
Includes informative data on many subjects: deer population trends, kill, and management; transplants of pronghorn and bighorn; status of upland game birds; duck breeding populations and banding; success of half-day goose-hunting system; work done in habitat development; and results of aerial censuses of game.

Oregon. 1955-1956 BIENNIAL REPORT / OREGON STATE GAME COMMISSION. 48 p., illus. [1957.]

Administrative report giving financial accounting and general report on activities of department. Graphs show harvests and hunter numbers for the past 5-8 years for deer, ducks, geese, pheasant, and quail as well as the muskrat, beaver, and mink catch, 1951-55. Status of the various species of game is reviewed and progress of the state's habitat-improvement program and management-area program is outlined. Research projects of the Cooperative Research Unit are discussed briefly. An abundant supply of big game is attributed to favorable winter weather. Upland game production was poor in 1955 and the population declined somewhat. Chukar partridge, first released in 1951, are well established in several sections in e. Ore.--L. F. Stickel.

Pennsylvania. BIENNIAL REPORT 1955-1956 / PENNSYLVANIA GAME COMMISSION. Pa. Game News 27(11): 71-128, illus. Nov. 1956.

Gives good general picture of Commission activities and includes descriptions of research projects, habitat management work, and the farm-game cooperative program. Tabular data are given on estimated kills of all types of game, numbers of raw furs sold, bounties paid (weasel dropped from bounty list), game birds reared and released, game animals trapped and moved, and bear damage claims paid in last decade.

Virginia. ANNUAL REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES FOR THE FISCAL YEAR ENDING JUNE 30, 1954. 38 p. [1955?]

A detailed financial account comprises the bulk of the report. The game division briefly summarizes its plant distribution program, experimental and demonstration planting on rightofways, forest clearing and planting for game, Hogg Is. development for waterfowl, and a survey of the potentialities of Buggs Is. Reservoir. Turkey populations on state forests in central Va. were the highest in years and accordingly a controlled hunt was held. Turkeys were stocked in sw. Va. and experiments were made on winter feeding. New deer management studies were initiated; preliminary data are given on breeding season, fertility, and numbers.--L. F. Stickel.

Virginia. ANNUAL REPORT OF THE COMMISSION OF GAME AND INLAND FISHERIES FOR THE FISCAL YEAR ENDING JUNE 30, 1955. 41 p. [1956.]

Mainly a detailed financial account. The game division reports briefly on: plant distribution program and evaluation of it, forest habitat improvement by clearings and plantings, controlled hunts on forest lands for turkey and other game, turkey rearing and stocking, Hogg Is. waterfowl management program, deer management and the harvest problem, development of water holes and deer licks.--L. F. Stickel.

West Virginia. CONSERVATION COMMISSION ANNUAL REPORT 1955-56. W. Va. Cons. 20(8): 1-28, illus. Oct. 1956.

C. O. Handley's report on Game Management (p. 13-20) gives concise but informative summaries of management work done on farm and forest areas, progress in deer management, population research on cottontail, status and kills of quail and turkey, kill of bear, deer and turkey stocking, maintenance and improvement of public hunting grounds, etc. Quail and turkeys were more abundant than at any other time in the last 10 years. Ruffed grouse made a remarkable recovery from the previous year. Apparently the hot, dry June-July period of 1955 was favorable for production of upland game birds. Turkey kill was 1,593, the highest on record. "A new deer management plan has been designed to provide safeguards against over-shooting. Once a county kill in a hunter's choice season drops below a certain number, the county will return to antlered deer only for a minimum of two years, or until the deer herd has recovered sufficiently to warrant returning to an any-deer season. This number is based on the number of square miles of forest land in each county. The number is high enough that even though the kill drops below the index, the deer herd is still adequately safeguarded. Counties not supporting a large deer herd will have a buck season until the herd builds up enough to permit a hunter's choice season." Summary of a rabbit study indicates that about half of all juveniles are lost before hunting opens. Few rabbits live beyond their 4th autumn. Average cottontail life span is 1.1 years. Kill of bears was down to 83 from 93, perhaps because mast shortage caused wandering. Cannon-net was found to be much better than pen traps for live trapping turkeys.

Anon. MANAGING THE MYSTERIOUS LOUISIANA MARSHLANDS. La. Cons. 8(11): 8-11, 5 photos. Oct. 1956.

Interesting perspective on recent deterioration of La. marshlands. Primary factor in decline is indicated to be artificial containment of Miss. River into one delta channel. Former periodic overflows by the silt-laden river onto the delta made possible the rich marsh flora and fauna that existed until the past decade. Cessation of this natural process--together with secondary aggravating factors such as a hurricane, a drouth, and recent construction of canals for transportation and for pipelines--has caused much of the best marsh to erode away and has allowed salty water to replace excellent brackish or fresh marsh conditions. Correspondingly, muskrat yields have dropped during the past decade to about 1/5 of the former av. Steps toward correction of these trends have been initiated locally within the past couple of years. They have consisted of careful preliminary appraisals of conditions and factors, with subsequent establishment of water-control structures to prevent marsh erosion and to permit adjustment of water levels and salinities. Also there has been regulation of canal construction and of other operations detrimental to the marshes.--A. C. Martin.

Beal, Ernest O. (N. C. State Coll.) TAXONOMIC REVISION OF THE GENUS NUPHAR SM. OF NORTH AMERICA AND EUROPE. J. Elisha Mitchell Sci. Soc. 72(2): 317-346, 5 maps. Nov. 1956.

"The genus Nuphar [yellow water-lilies], as it occurs in North America and Europe, is here considered to consist of one polymorphic species, N. luteum, with nine recognizable subspecies..."

Beck, Robert. (Del. Game Comm.) USE OF HERBICIDES TO INCREASE GAME FOODS AND EDGE IN SOLID STANDS OF PHRAGMITES. Proc. NE. Sec. Wildl. Soc. et al. 1-3 p., mimeo. Jan. 1957.

Dalapon gave 95-100% control of dense stands of Phragmites on relatively dry sites, but not in marshes. Game-food plants of several kinds volunteered freely in the cleared areas. Game animals used the areas much more. Hunter access was easier and bags were larger. Control of Phragmites and stands of food plants were still good after 3 years. Recommended application is to spray 42 lbs. of commercial Dalapon per acre. Time may vary from when new growth is 3' tall to early fruiting stage. Cost of herbicide is about $40 per acre.

Chapman, H. C., and F. Ferrigno. (USDA, Agr. Res. Serv.) A THREE-YEAR STUDY OF MOSQUITO BREEDING IN NATURAL AND IMPOUNDED SALT-MARSH AREAS IN NEW JERSEY. Proc. 43d Ann. Meeting N. J. Mosquito Extermination Assn. p. 48-64. Mar. 1956.

More than 90% of mosquitoes biting during the day in the coastal areas near Tuckahoe, N. J. are Aedes sollicitans. Impoundments reduced breeding of this species about 95% in 1953. In 1954 and 1955 it was impossible to maintain water at meadow level and impoundments reduced the breeding of Aedes only about 65% in 1954 and 75% in 1955. Larger populations of Anopheles and Culex were produced on impoundments than on salt-marsh areas, but shorter flight range and nocturnal habits of these forms made this production of little importance. The effects of dynamiting on reducing mosquitoes were pronounced in the vicinity of the blasted area but insignificant farther away. Overall utilization by waterfowl increased substantially on impoundments containing an abundance of food. Muskrat increase was mainly on impoundments containing perennials, the impoundments least attractive to waterfowl. Management plan best to reduce Aedes and increase food production for waterfowl is a late drawdown--July or Aug.--followed by flooding as soon as the millet has some growth. Detailed tables summarize weather and tidal data, mosquito sampling results in experimental and check areas, mosquito numbers in relation to vegetation and ecological types, and light trap collections.--L. F. Stickel.

Cofer, Henry P. (Del. Game Comm.) EFFECTS ON PLANTS AND WATERFOWL WHEN SALT WATER IS INTRODUCED INTO A FRESHWATER POND. Proc. NE. Sec. Wildl. Soc. et al. 1-3 p., mimeo. Jan. 1957.

Silver Lake, Rehoboth Beach, Del., was a fertile lake and a successful state waterfowl refuge. Local people objected to odors from decaying vegetation and because vegetation was too dense for use of motorboats. They got a law passed to compel pumping of seawater into the lake. Game officials were allowed

to prescribe pumping schedules and thus had some control over salinity. A level of 1½% sea salinity was the goal selected. The aim was reduction of vegetative mass and retention of some of the better waterfowl plants. Pumping began in Aug. 1954. In practice, salinity fluctuated between 1½% and 22%. Some plants disappeared, others came in. Widgeongrass increased while other good waterfowl plants decreased. Odors were abated, vegetation was thinner, and local people were able to use motorboats as they wished. Usage by Canada geese dropped to about 50%, by canvasbacks to about 33%.

Fergus, C. L., W. M. Sharp, and Eugene Decker. (Pa. State U.) THE ROLE OF PLANT DISEASES IN WILDLIFE FOOD PLANTS: A SMUT ON DOTTED SMARTWEED. Plant Dis. Reporter 40(11): 1017-1018. Nov. 1956.

Seed production of Polygonum punctatum in Conneaut Marsh, Crawford Co., Pa., was studied in 1953. Av. number of spikes per sq. yd. was 373. Spikes ruined by smut (Ustilago utriculosa) av. 5.6%. This was not serious under the circumstances, but some diseases of wildlife plants have been seriously destructive and others might become so. Authors urge more study of this factor in wildlife management.

Ferrigno, Fred. (N. J. Div. Game.) MOSQUITO PRODUCTION STUDIES AND CONTROL ON SALT MARSHES IN SOUTHERN NEW JERSEY (A PROGRESS REPORT). Proc. NE. Sec. Wildl. Soc. et al. 1-8 p., mimeo. Jan. 1957.

Data are given on mosquito production in various habitats of 3 marshes and on the factors affecting production. These factors are such things as amount of tidal flushing, suitability of a site for mosquito-eating fish, extent of snow-goose eat-outs, etc. Much variation was found from site to site. Management for waterfowl and mosquito control will have to be based on specific data for a given site or an exactly defined type.

Greenwald, Margaret. SUPPLEMENT TO THE LIST OF REFERENCES ON CONTROL OF AQUATIC PLANTS, INCLUDING ALGAE. Chipman Chem. Co., Bound Brook, N. J. 1-12 p. Jan. 1957. Available on request.

Lists some 275 references that did not appear in author's 1956 list [see WR 8½(12)]. These references are from many sources: published, semipublished, theses, etc.

Grigsby, B. H., C. A. Reimer, and W. A. Cutler. FURTHER STUDIES ON THE USE OF DALAPON FOR THE CONTROL OF CATTAIL (TYPHA). North Central Weed Control Conference Proceedings 12: 60-61. 1955. [From Weeds 5(2).]

Larson, Joseph S., and Charles H. W. Foster 2nd. (U. Mass.) MASSACHUSETTS MARSHES--AND THEIR OWNERS. Wildl. Cons. Inc., 20 Spruce St., Boston, Mass. 13 p., mimeo. Oct. 1955.

Survey was made of a number of small, shallow, fresh marshes. Condition of each marsh was determined and each owner was interviewed to ascertain his attitude toward and plans for his marsh. Most marshes were of 10-20 acres. Few were subject to great fluctuation of water level. Several were drained or were to be drained. Most were open to hunting; some were closed because of bad conduct by hunters. Few were being trapped; more could be in line with multiple use. Ownership was highly diversified. So were plans for marsh use, but most owners had some plans for use. Fishing, waterfowl, other wildlife, and esthetic motivations were important to owners. Few owners cared to sell their marshes. In short, owners had pride in their marshes and could be encouraged to make wise use of them. It is recommended that marsh owners be approached through various channels to educate them in sound, multiple use and that demonstration projects be set up. "Formation of a central state wetlands committee would facilitate greatly the effective coordination of effort."

MacMullan, R. A., and E. M. Harger. (Box 97, The Heights, Mich.) CONTROL OF UNDESIRABLE PLANTS IN WATERFOWL PROJECTS. North Central Weed Control Conference Proceedings 12: 58-59. 1955. [From Weeds 5(2).]

McLain, Paul D. (N. J. Dept. Cons.) PRODUCTION OF WATERFOWL FOODS ON IMPOUNDMENTS AND MARSHES WITH LOW QUALITY SOILS. Proc. NE. Sec. Wildl. Soc. et al. 1-12 p., mimeo. Jan. 1957.

Detailed account of successful management experiments in s. coastal N. J. Using summer drawdowns, it was found that best food production was in first 2 years. After that, invasion by undesirable plants was heavy; a year or 2 of continuous flooding is recommended to get rid of them. Japanese millet grew well on drawdown flats after clearing, cultivation, liming, fertilizing, and seeding. Water level was raised as millet grew, which suppressed competitors. Cost was about $40 per acre annually (after clearing) but waterfowl use was spectacularly high. Presence of a field of young rye prevented deer depredation on ripening millet. An abandoned cranberry bog was planted to Japanese millet for 2 years. In years 3-5, millet was produced annually by a June drawdown, which permitted natural reseeding. Fertilizer was applied each year. Drawdowns were usually of less than 3 weeks--long enough to permit mechanical attack on water lily--so water was present when broods needed it.

Springer, Paul F., and Richard F. Darsie, Jr. (Patuxent Refuge, Laurel, Md.) STUDIES ON MOSQUITO BREEDING IN NATURAL AND IMPOUNDED COASTAL SALT MARSHES IN DELAWARE DURING 1955. Proc. 43d Ann. Meeting N. J. Mosquito Extermination Assn. p. 74-79. Mar. 1956.

Third-year studies on Bombay Hook Refuge bore out findings of previous years. Production of pestiferous mosquitoes occurred mainly in saltgrass and saltmeadow cordgrass at mean high-tide level. Impoundments in this zone resulted in almost complete elimination of Aedes sollicitans, Aedes cantator and Anopheles bradleyi. Certain other mosquitoes, of less importance as pests, were favored by impoundments.--L. F. Stickel.

Webert, F. J. HURRICANE DAMAGE TO FUR INDUSTRY. La. Cons. 8(12): 10-13, 20-21, 7 photos. Nov. 1956.

Describes effect on La. marshlands of hurricane of Sept. 24, 1956. Effects on fur animals and waterfowl habitats are given most attention. Losses of animals were high, varying from place to place. Exceptionally high water levels caused by hurricane provided buffering action that prevented too much washing. Some waterfowl areas actually were improved.

Zwerman, P. J., committee chairman. (Cornell U.) PRELIMINARY REPORT OF THE COMMITTEE ON DRAINAGE. J. Soil and Water Cons. 12(1): 38-39. Jan. 1957.

Presents for criticism a proposed system of classification and nomenclature for lands that are or may be drained. The system is applicable to wild land or crop land. It is intended to reduce the opportunity for misunderstanding between professional groups of varying interests.

FARMLAND & WILDLIFE

Davidson, Joe B. (400 E. Washington St., Monticello, Ill.) HYBRID SORGHUMS FOR SHOOTING PRESERVES. Modern Game Breeding & Hunting Club News 27(4): 8-9, 2 photos. Apr. 1957.

New hybrid sorghums offer much promise for food patches on shooting preserves or other game areas. Good varieties are 3-5' tall, resist lodging, and can be harvested for poultry feed after shooting season. They permit light to reach ground and hence can be planted with millet and sudan grass to increase food and cover. There are varieties suitable for many parts of the country. Instructions are given for planting and sources of further information are listed.

Graham, Edward H. (US Soil Cons. Serv.) WILDLIFE HABITAT IMPROVED. Soil Cons. 22(4): 75-79, 7 photos. Nov. 1956.

General discussion of what farmers and ranchers of U. S. are doing to help wildlife by way of building ponds, planting hedges and borders, and other practices that are approved under the SCS program.

FARMLAND & WILDLIFE--Continued

Hamilton, Thomas E. (Soil Bank Div., CSS, USDA.) [THE SOIL BANK PROGRAM AND WILDLIFE.] Proc. NE. Sec. Wildl. Soc. et al. 1-5 p., mimeo. Jan. 1957.
How and why the soil bank program operates. As the author points out, the program can be of great value to wildlife, but whether it is or not depends on individual landowners. Furthermore, the plan basically provides for only temporary retirement of land from cultivation. [In essence, then, wildlife gains are likely to be incidental, spotty, and short-term. The program does, however, provide an important new fulcrum that can aid in getting wildlife work done on many tracts. And gains incidental to placing land in trees or grass may be considerable.]

Linehan, John T. (Patuxent Refuge, Laurel, Md.) SONGBIRDS IN LIVING FENCES. Soil Cons. 22(10): 233-234, 2 photos. May 1957.
Spring counts of songbirds were made along each of three 660-foot strips in field borders of the following types: mature multiflora rose, young multiflora rose, other shrub hedges, and barbed wire fences. All mature shrub hedges had more birds than did wire fences, either clear cut or bordered by weeds and tall grass. Tatarian honeysuckle had greatest numbers of birds but rose hedges had more species.--L. F. Stickel.

Penfound, Wm. T., and Elroy L. Rice. (U. Okla.) EFFECTS OF FENCING AND PLOWING ON PLANT SUCCESSION IN A REVEGETATING FIELD. J. Range Mgt. 10(1): 21-22. Jan. 1957.
In prairie type at Norman, Okla.

Stegner, Ed. (130 E. McCarty St., Jefferson City, Mo.) AS ONE SPORTSMAN TO ANOTHER... Mo. Cons. 18(1): 14-16, 4 photos. Jan. 1957.
How sportsmen can cooperate with farmers to get better game conditions under the Soil Bank Law. The several specific suggestions center around the idea that sportsmen's groups could arrange with farmers to pay the 20% of improvement costs that the government does not pay. The groups would then have a share in planning and use of improvements.

Tulenko, Paul Q. (Mo. Cons. Comm.) WILDLIFE AND THE SOIL BANK. Mo. Cons. 18(1): 4-6, 10 figs. Jan. 1957.
Describes and diagrams several plans by which wildlife improvements can most practically be constructed under the Soil Bank Law. These plans are for specific management patterns that can be applied to sites of various types.

Zorb, Gordon L. (Mich. Dept. Cons.) RESEARCH PROGRESS REPORT ON CHEMICAL SEEDBED PREPARATION FOR WILDLIFE FOOD PATCHES. Down To Earth (Dow Chem. Co., Midland, Mich.) 12(3): 8-9, 2 photos. Winter 1956.
Experiments with sodium dalapon and 2,4-D gave promising results and are being continued. To date, however, conventional seed-bed preparation has been cheaper and more productive. "A program of fall application of dalapon, followed by spring application of 2,4-D, fertilization, and planting should compare favorably upon the basis of cost and food production with conventional tillage. Moreover, the chemical routine may be useful in areas suited for wildlife where conventional tillage cannot be used."

RANGELAND & WILDLIFE

Albertson, F. W., G. W. Tomanek, and Andrew Riegel. (Fort Hays Kans. State Coll.) ECOLOGY OF DROUGHT CYCLES AND GRAZING INTENSITY ON GRASSLANDS OF CENTRAL GREAT PLAINS. Ecol. Monog. 27(1): 27-44, 10 figs. Jan. 1957.
Quantitative studies at many sites demonstrate that overgrazing intensifies effects of drought to a tragic degree. Eroding, desert-like ranges are the final product. Recovery of native vegetation may require 20 years of favorable weather on overgrazed land as compared with 5 years on moderately grazed land. "With all the information on range management at hand through research and extension service of our colleges and universities, we are little better off, it seems, than those who abused the native ranges before the dawn of Christendom... Man today needs someone to point the way as did Isaiah of old."

Blaisdell, James Pershing. SEASONAL DEVELOPMENT AND YIELD OF NATIVE PLANTS ON THE UPPER SNAKE RIVER PLAINS OF IDAHO AND THEIR RELATION TO CLIMATIC FACTORS, ESPECIALLY PRECIPITATION AND TEMPERATURE. Ph.D. thesis, U. Minn. 146 p. 1956. [From long abstract in Dissertation Abstracts 16(12).]

Countryman, Clive M., and Donald R. Cornelius. (Calif. For. & Range Exp. Sta., Berkeley.) SOME EFFECTS OF FIRE ON A PERENNIAL RANGE TYPE. J. Range Mgt. 10(1): 39-41, 3 photos. Jan. 1957.
Effect of wildfire on bitterbrush and perennial grass type in Klamath Natl. For., Calif. After 6 years bitterbrush is still lacking and palatable grasses are scarce. Weed species are expected to take over for some time. Grazing contributed to damage of the burned area.

Elder, James B. (Kans. State Coll.) WATERING PATTERNS OF SOME DESERT GAME ANIMALS. J. Wildl. Mgt. 20(4): 368-378, 1 graph. Oct. 1956.
A study was made of utilization of 2 man-made desert watering places in s. Ariz. from June 1951 to Jan. 1953 by desert mule deer, javelina, white-winged dove, mourning dove, and Gambel's quail. Data were collected by direct observations and track counts. Tank usage by mule deer, javelina, and Gambel's quail was highest during the spring and early summer dry period with a lesser peak in use during the fall dry period. Least use was during late summer and winter rainy periods. Spring and summer usage by white-winged and mourning doves remained high during both dry and rainy seasons. From a practical management standpoint, open water was considered an essential habitat requirement for mule deer from May through Oct., for javelina and Gambel's quail during the spring-summer and fall dry periods; and at all times for doves. The erratic behavior of mule deer and javelina precludes the use of waterhole counts as a reliable census technique. Doves and Gambel's quail can probably be censused accurately provided the daily frequency of water hole visits is first determined. No evidence of predation was observed at or near the tanks. While animals were tolerant of the presence of humans near tanks, there was no indication that they had lost their inherent wildness.--James B. Elder.

Hanson, Herbert C. (Catholic U., Wash., D. C.) THE USE OF BASIC PRINCIPLES IN THE CLASSIFICATION OF RANGE VEGETATION. J. Range Mgt. 10(1): 26-33, 2 photos. Jan. 1957.

Heady, Harold F. (Sch. For., U. Calif., Berkeley.) CHANGES IN A CALIFORNIA ANNUAL PLANT COMMUNITY INDUCED BY MANIPULATION OF NATURAL MULCH. Ecol. 37(4): 798-812, 6 figs. Oct. 1956.

Herbel, Carlton Homer. RESPONSE OF TRUE PRAIRIE VEGETATION ON MAJOR FLINT HILLS RANGE SITES TO GRAZING TREATMENT. Ph.D. thesis, Kans. State Coll. 144 p. 1956. [From long abstract in Dissertation Abstracts 16(12).]

Johnson, W. M. (For. & Range Exp. Sta., Ft. Collins, Colo.) THE EFFECT OF GRAZING INTENSITY ON PLANT COMPOSITION, VIGOR, AND GROWTH OF PINE-BUNCHGRASS RANGES IN CENTRAL COLORADO. Ecol. 37(4): 790-798, 5 figs. Oct. 1956.

Moinat, A. D. (Colo. State Coll., Greeley.) COMPARATIVE YIELDS OF HERBAGE FROM OAK SCRUB AND INTERSPERSED GRASSLAND IN COLORADO. Ecol. 37(4): 852-854, 2 figs. Oct. 1956.

Pearson, Bennett O. (Calif. For. & Range Exp. Sta., Berkeley.) BITTERBRUSH SEED DORMANCY BROKEN WITH THIOUREA. J. Range Mgt. 10(1): 41-42. Jan. 1957.
Should make possible spring planting of deer ranges, but so far survival has been only 10% of viable seed planted.

Reynolds, H. G., and J. W. Bohning. (For. & Range Exp. Sta., Ft. Collins, Colo.) EFFECTS OF BURNING ON A DESERT GRASS-SHRUB RANGE IN SOUTHERN ARIZONA. Ecol. 37(4): 769-777, 6 figs. Oct. 1956.

Sweeney, James R. RESPONSES OF VEGETATION TO FIRE; A STUDY OF THE HERBACEOUS VEGETATION FOLLOWING CHAPARRAL FIRES. U. Calif. Publ. Bot. 28(4): 143-249, illus. 1956. $2.00. [From Monthly Checklist of State Publ. 47(11).]

FORESTLAND--FORESTRY & ECOLOGY

Fitch, Henry S., and Ronald L. McGregor. (U. Kans.) THE FOREST HABITAT OF THE UNIVERSITY OF KANSAS NATURAL HISTORY RESERVATION. U. Kans. Publ., Mus. Nat. Hist., 10(3): 77-127, 2 pls., 7 figs. Dec. 1956.

This study area near Lawrence is now protected but was subjected to much disturbance in earlier days. Proportions of prairie and forest changed, forest composition was altered greatly by cutting and grazing, and erosion was accelerated for a considerable period. The present paper discusses original conditions, history of area, composition of forest today, invasion of fields by forest, competition and mortality of trees, effects of livestock, and major vertebrates present. It then discusses trees species by species, considering past and present status, reasons for changes of status, growth, and usage by wildlife. Quite a bit of numerical data is presented, mostly in tables, but the text is primarily qualitative and the authors have made it readable and interesting.

Lindsey, Alton A. (Purdue U.) SAMPLING METHODS AND COMMUNITY ATTRIBUTES IN FOREST ECOLOGY. For. Sci. 2(4): 287-296. Dec. 1956.

Summary: "Substantial progress has been made recently in the development of improved ecological sampling techniques for analysis of forest communities. The vegetational attributes constituting the objectives of sampling methods are redefined and their interrelationships indicated by means of a symbolic system presented in tabular form. The recent expansion of quantitative methods and concepts suggests the usefulness of symbols and formulae, particularly in the teaching of ecology. Two new summary expressions, prevalence and predominance, which integrate the role of cover with other parameters, are introduced. Two general groups of methods, detailed vs. rapid survey methods, are distinguished. Detailed sampling techniques include the quadrat method involving surveyed boundaries, and the line-strip method--which combines a linear unit and an areal strip but in which only the line is surveyed. Rapid methods include distance or spacing methods such as the random-pairs and the preferable quarter method, and the Bitterlich variable-plot-radius method. The various methods are evaluated, and a new method, involving use of instruments from one point to combine variable-radius sampling with the quadrat, is suggested."

Thornton, Philip L. (US For. Serv., Upper Penin. For. Res. Center, Marquette, Mich.) PROBLEMS OF MANAGING UPPER MICHIGAN'S CONIFEROUS SWAMPS. J. For. 55(3): 192-197, 1 photo. Mar. 1957.

Written from forest-management viewpoint, but should be of interest to those concerned with wildlife aspects of this forest type.

FORESTLAND--MANAGEMENT FOR & DAMAGE BY WILDLIFE

Edwards, R. Y., A. T. Cringan, C. D. Fowle, R. C. Passmore, A. J. Reeve, and D. J. Robinson. (B. C. For. Serv., Victoria.) FORESTRY AND WILDLIFE MANAGEMENT --DUAL ENDEAVORS ON FOREST LAND. For. Chronicle 32(4): 433-443. Dec. 1956.

Authors' abstract: "The main theme of the paper is that forest management influences the abundance of wildlife, and that wildlife is part of every forest. Forest management and wildlife management are inescapably linked by similar aims on the same land. The use of the forests for wood production is an imposed condition on wildlife managers, and the report shows by interesting examples the interplay of these two influences on the management problems of each."

Gerstner, H. A NEW TOOL FOR REDUCING BARK DAMAGE BY RED DEER. Allgem. Forstztg. 1955: 294-295. 1955. [From German abstract by Ruhl in Z. Jagdwissenschaft 2(3).]

In German. The author has developed a bark plane which loosens small strips of bark. The small amounts of pitch and scar tissue that result from these wounds are a lasting protection against damage by wildlife.--V. F. Flyger.

Gysel, Leslie W. (Mich. State U.) MEASUREMENT OF ACORN CROPS. For. Sci. 2(4): 305-313, 1 photo. Dec. 1956.

Summarises some factors affecting production of acorns and evaluates various devices and methods used in U. S. for measuring acorn crops. Results from recent acorn-production studies in Mich. are described. Measurements of acorn crops can be made by counts of acorns on trees or by estimates from periodic collections

from ground quadrats or seed traps. Differences in acorn counts between pairs of seed traps and also larger groups of traps under the same exposed tree crown were relatively small. Differences between samples collected periodically in seed traps and adjacent open quadrats were also generally small in comparison to total number of acorns in sample. One or 2 ground-quadrat sampling units per tree may be adequate for many studies.--Author.

Hall, John M. (Ariz. Game Dept.) COOPERATIVE WILDLIFE IMPROVEMENT PROJECTS ON NATIONAL FOREST LANDS. Ariz. Game & Fish Dept. Wildl. News 4(1): 8-10. Winter 1957.

History, problems, and types of cooperative agreements between the Forest Service and state game departments are reviewed, with especial reference to Ariz. Recommendations for future policy include: (1) allocation of a proportion of grazing rights to game on suitable ranges on Forest Service land, and management of game and cattle accordingly; (2) more controlled use of sportsmen's funds for the benefit of game, particularly at lake developments; (3) fuller recognition of need for recreational use planning on forest land; (4) policy changes to permit game departments to buy base properties and their accompanying grazing rights with the same privileges now allowed individuals. The game departments could then buy up areas and improve the habitat for game with some guarantee of long-term benefits to game. Under the present system, as described, the game department can buy the properties and restore the range but has no continuing rights concerning grazing the land nor any revenue rights from such grazing.--L. F. Stickel.

Jahrig. H. IS FOREST DAMAGE BY WILDLIFE UNAVOIDABLE? Der Forst- und Holzwirt 1956: 34-36. 1956. [From German abstract by Ruhl in Z. Jagdwissenschaft 2(3).]

In German. Most damage to forests in Europe is the result of feeding by red deer. Author suggests planting and fertilizing grazing areas throughout the woods using fire lanes, electric line right-of-ways, and road sides. This will not eliminate damage but should reduce it considerably.--V. F. Flyger.

Kitchens, James H., Jr. EDITORIALLY SPEAKING. Forests & People 6(4): 2. 4th quarter 1956.

The Forest-Game Management Committee of the La. For. Assn., under Wes Sentell, has studied the conflict of interest between foresters on one side and wildlifers and hunters on the other. Under scrutiny, this conflict apparently boils down to one point: Timber Stand Improvement versus squirrels. Since it is uneconomic to leave cull hardwoods for squirrels, the committee "suggests the propagation of squirrel food trees or shrubs--plants which will occupy only a small part of the forest stand but will be consistent, prolific and dependable producers of nutritious food for our game. ...a den tree is the most wasteful of all trees in the forest 'created by the whims of nature with no plan or design.'" The committee recommends that den trees be replaced by nest boxes built and erected with cooperation of wildlife and youth groups. Economy and practicality of these artificial measures are not discussed and food plants that would meet the requirements are not listed.

Mayer-Krapoll, Herman. THE USE OF COMMERCIAL FERTILIZERS--PARTICULARLY NITROGEN--IN FORESTRY. Publ. first by Ruhr-Stickstoff Aktiengesellschaft, Bochum, Germany. Translated and publ. in U. S. by Nitrogen Div., Allied Chem. & Dye Co., 40 Rector St., N. Y. 6, N. Y. I-111 p. 1956. Free on request to Nitrogen Div., Allied Chem. Co.

Apparently much work has been done abroad on improvement of forest soils by liming and fertilizing. The work is brought together here in 11 chapters, the last of which, p. 94-101, is "Fertilizing of Game Browsing Areas." Author points out that damage by big game to trees and field crops can be minimized by creation of good feeding areas. These areas also result in heavier animals and better trophies. The areas should be scattered through the forest and planted with various carefully selected agricultural crops. Liming and fertilizing are essential. Suitable crops for different sites and different times of year are listed and proper fertilizing schedules are tabulated. Attention is given to winter foods. Several German references on this subject are cited in the bibliography of 112 titles. In general, the approach is too intensive for most parts of the U. S. at the present time, but it should be applicable

now in many areas where there are management problems. A recent American article has called attention to the great attractiveness of fertilized areas and their value in lessening crop damage and in aiding herds to withstand winter (N. P. Knott, Proc. 36th Ann. Conf. W. Assn. State Game & Fish Comms., p. 207-209, 1956).

Seiskari, Pertti. ON THE WILLOW SPECIES FAVORED BY THE MOOSE, SNOW HARE AND WILLOW PTARMIGAN. Suomen Riista 10: 7-17, 6 figs. 1956.
In Finnish. English abstract on separate mimeo. sheet. From abstract: Height of winter feeding is similar in all 3 species. Moose feeds on approximately equal quantities of Salix aurita, S. caprea and S. cinerea. The hare favors S. cinerea and S. caprea, and the ptarmigan favors S. phylicifolia. Willows probably can be developed into most important sources of winter food for game.

Strode, Don. (Fla. Game Comm.) T.S.I. AND WILDLIFE HABITAT / A PRELIMINARY REPORT. Fla. Wildl. 10(8): 10-13, 41-42, 8 photos. Jan. 1957.
Quantitative studies were made of "weed" oaks killed in timber stand improvement in several forest types of Ocala Natl. For., Fla. Results are reported in detail. In general, the more oaks left, the better for mast production and hence for game. But thinning of heavy oak stands should increase both mast and browse. Where only 2-3 oaks per acre were left, wildlife would suffer. Where 10-20 oaks per acre were left, injury to wildlife habitat would be less. Where 20-50 oaks per acre were left, the effect probably would be neutral. These figures pertain to the longleaf pine areas. In a hardwood swamp, reduction of oaks seriously injured squirrel and turkey habitat but temporarily improved deer browse conditions. In sand pine areas, game food production was greatly decreased. Effects varied in slash pine areas, but were harmful where large live oaks were killed. Recommendations for changes in T.S.I. work were arrived at by Game Comm. and For. Serv. personnel and are quoted here. Among other things, they provide for leaving stated numbers of good mast producing trees in each acre of a given forest type, and for leaving 4 den trees per 10 acres and all occupied den trees. Tree and shrub species that are desirable for wildlife are listed.

Verme, Louis J. (Mich. Dept. Cons., Shingleton.) ACORN CONSUMPTION BY CHIPMUNKS AND WHITE-FOOTED MICE. J. Mamm. 38(1): 129-132. Feb. 1957.
Amounts consumed and preferences in captivity (Peromyscus leucopus and Tamias striatus).

STRIPPED LAND & MISCELLANEOUS HABITATS

Beatty, R. H. CONTROL OF BRUSH ON RIGHTS-OF-WAY. North Central Weed Control Conference Research Report 12: 163-165. 1955. [From Weeds 5(2).]

Conn. Botanical Society Rightofways Vegetation Committee and Conn. State Board of Fisheries and Game. PUBLIC UTILITY RIGHTOFWAYS--VEGETATION MANAGEMENT. Proc. NE. Sec. Wildl. Soc. et al. 1-6 p., mimeo., 2 figs. Jan. 1957.
Policy and recommendations. Needs of the utility are paramount, but wildlife, forestry, botanical, aesthetic, and recreational values should also be considered in management. Recommended for optimal wildlife habitat: central strip of grasses and forbs; sides with shrubs grading upward in height to forest margin. Central strip will vary in width with local needs. Plantings for wildlife may be made. Game officials will prescribe botanical specifications when requested. Measures for wildlife will not be taken where they would conflict with needs of rare plants or rare plant associations or with important landscape values. Recommended for brush control at lowest cost for the most years with highest general conservation values: narrow central trail, preferably grassy; most of central strip in low woody and herbaceous vegetation; sides with shrubs and low trees growing as densely as possible to hold back tree invasion. Many kinds of native shrubs are good for these purposes. The best ones should be saved, for they are the cheapest control of unwanted brush and many of them provide good food and cover for wildlife. Various plant-killing methods will have to be used; no single one is adequate. Plans should be for 25-year period to preclude treatments that seem cheap at the time but would be ineffective in the long run. Recommended for newly constructed rightofways: clear-cutting limited to minimal central strip; stumps treated with herbicides; sides disturbed as little as possible, but large danger trees removed and smaller trees removed then or later.

Egler, F. E., and Wm. A. Niering. (Aton For., Norfolk, Conn.) LIST OF COMMON NATIVE SHRUBS FOR RIGHTOFWAYS. Rightofway Veg. Com., Conn. Bot. Soc., Pap. no. 3. 2 p., proc. Dec. 1956.

List of 75 desirable Conn. species, with indication of whether tall or low-growing.--L. F. Stickel.

Lowry, Gerald L. (Ohio Agr. Exp. Sta., Wooster.) FIVE-YEAR STUDY EVALUATES FOREST TREE VARIETIES FOR SPOIL BANKS. Ohio Farm & Home Res. 41(302): 70-71, 2 figs. Sept.-Oct. 1956.

Data on survival and growth of several species on acid, marginal, and toxic sites in strip-mined tracts of Ohio. Black locust is excellent for site stabilization and for encouragement of volunteer vegetation. For pulpwood and sawtimber, sycamore, sweetgum, white pine, catalpa, and chestnut oak are about equally advisable. Unsuccessful were white ash, tulip poplar, black walnut, and several others. "Various combinations of commercial hardwoods mixed with different proportions of black locust appear to be the solution to many of today's planting problems." Deserving of further testing are northern white-cedar, hybrid poplar, and thornless honey locust.

Niering, Wm. (Conn. Coll., New London.) A PROGRAM FOR ECOLOGICAL RIGHTOFWAY VEGETATION MANAGEMENT. Rightofway Veg. Com., Conn. Bot. Soc., Pap. no. 2. 2 p., proc. [Nov. 1956.]

Recommendations for rightofway management include (1) clear cutting and chemical treatment of a narrow central path; (2) side cutting of only those trees endangering wires, root-kill of smaller trees then or later, permitting shrub development beneath them; (3) maintenance of central open trail of low grasses about 8 ft. wide, flanked by low woody or herbaceous vegetation, and these in turn flanked by as dense growth of shrubby vegetation as possible; (4) selective as opposed to blanket herbicide treatments to achieve desired results; (5) vegetation management specifications set up for each line by the utility corporation itself.--L. F. Stickel.

Niering, Wm. A., F. E. Egler, and R. H. Goodwin. (Conn. Coll., New London.) THE RIGHT-OF-WAY VEGETATION COMMITTEE OF THE CONNECTICUT BOTANICAL SOCIETY. Rightofway Veg. Com., Conn. Bot. Soc., Pap. no. 1. 2 p., proc. [Feb. 1956.]

Purpose of this group is to investigate Conn. rightofways and their management with a view to developing practical procedures to benefit wildlife while maintaining rightofways in suitable condition for other purposes. The first project (described briefly here) is a survey of rightofways, their past treatments and present status.--L. F. Stickel.

CONTROL OF UPLAND VEGETATION WITH HERBICIDES ETC.

Leonard, O. A., and W. A. Harvey. CHEMICAL CONTROL OF WOODY PLANTS IN CALIFORNIA. Calif. Agr. Exp. Sta. (Berkeley), Bul. 755. 40 p., illus. Aug. 1956.

Detailed suggestions for use of herbicides and other methods of controlling a wide variety of woody plants. Tables at the end give specific recommendations for treatment of each type of pest shrub or tree.

McQuilkin, W. E. (NE. For. Exp. Sta., Upper Darby, Pa.) THE KEY TO EFFECTIVE BASAL SPRAYING OF WOODY PLANTS: WET THE ROOT COLLAR. J. For. 55(2): 143-144. Feb. 1957.

Ruch, Lewis C. (Mich. Dept. Cons.) CREATING AND MAINTAINING WILDLIFE OPENINGS IN WOODED AREAS BY USE OF HERBICIDES. Down to Earth (Dow Chem. Co., Midland, Mich.) 12(4): 2-3, 16, 5 photos. Spring 1957.

Many forms of game benefit from large or small openings, mixed habitats, early successional stages, or dense stands of sprout growth. It is not always feasible to achieve these conditions with commercial cutting or fire. Much can be done with 2,4-D and 2,4,5-T applied in varying frequency and from ground or air, depending on results desired. Ruch discusses methods being used in Mich., with consideration of dosages, equipment, and policies for various objectives and situations.

Rudolf, Paul O., and Richard F. Watt. CHEMICAL CONTROL OF BRUSH AND TREES IN THE LAKE STATES / A REVIEW OF PRESENT KNOWLEDGE. US For. Ser., Lake States For. Exp. Sta. (St. Paul 1, Minn.), Sta. Pap. no. 41. 58 p., 3 figs. Oct. 1956.

Much information on use of various herbicides. An appendix tells just what applications to use for control of specific woody plants. Eighty references.

MAMMALS--GENERAL

Dunnet, G. M. (Wildl. Surv. Sec., C.S.I.R.O., Univ. Grounds, Nedlands, W. Aust.) A POPULATION STUDY OF THE QUOKKA, SETONIX BRACHYURUS QUOY & GAIMARD (MARSUPIALIA). I. TECHNIQUES FOR TRAPPING AND MARKING. C.S.I.R.O. Wildl. Res. 1(2): 73-78, 1 fig., 2 pls. Dec. 1956.

Trapping and marking methods for this rat-kangaroo, which weighs 5-8 lbs. The trap is an all-metal box trap which has solid walls (animals injure themselves if they can see through) and as much of the mechanism as possible on the outside to hinder clinging by certain species. A long-net trap is described; the net is lifted by pulleys to confine the animals. The long-net may have limited value with other animals, as it is relatively difficult to install and requires 4 operators right at hand. Fingerling tags in ear and collars were satisfactory for marking; wing tags and ear disks were less satisfactory. Durafur Black R dye rubbed into fur was adequately detectable for 6 weeks. Scotchlite reflective tape on tags aided spotting at night.

Landau, Barbara Ruth. PHYSIOLOGY OF MAMMALIAN HIBERNATION. Ph.D. thesis, U. Wis. 175 p. 1956. [From long abstract in Dissertation Abstracts 16(1).] Detailed study. Subject species was thirteen-lined ground squirrel.

Lord, Rexford D., Jr. (Ill. Nat. Hist. Surv., Urbana.) THE LOSS OF EAR TAGS IN THE GRAY FOX AND RACCOON. J. Mamm. 37(4): 548. Nov. 1956.

Tags were lost by 1/3 of foxes but by few raccoons.

Morrison, Peter R., and Wm. J. Tietz. (U. Wis.) COOLING AND THERMAL CONDUCTIVITY IN THREE SMALL ALASKAN MAMMALS. J. Mamm. 38(1): 78-86, 1 graph. Feb. 1957.

Pazelt, V. THE OVARIES OF CARNIVORES AND THEIR INTERSTITIAL CELLS. Z. Mikrosk.-Anat. Forschg. 61(3): 309. 1955. [From German abstract by Mendheim in Z. Jagdwissenschaft 2(3).]

In German. Ovaries of badger, fox, dog, polecat and ermine were examined. In badger ovulation started before the winter rest but among others in late winter or spring. In badger a complete capsule exists. A partial capsule exists in bear and Canidae but is entirely lacking in Felidae.--V. F. Flyger.

Taber, Richard D. (U. Calif., Berkeley.) USES OF MARKING ANIMALS IN ECOLOGICAL STUDIES: MARKING OF MAMMALS; STANDARD METHODS AND NEW DEVELOPMENTS. Ecol. 37(4): 681-685. Oct. 1956.

Review of many methods used in marking mammals.

MAMMALS--FAUNAS AND MANUALS

Grayce, Robert L. (141 Main St., Rockport, Mass.) CHECKLIST OF NEW ENGLAND MAMMALS. Bul. Mass. Aud. Soc. 41(1): 15-24, 26, 1 photo. Jan. 1957.

Useful list with brief, general statements of status and range. It includes an interesting record of fisher in Mass. in 1956. Nomenclature is not strictly up to date. Apparently the author did not use the Miller-Kellogg checklist and certain other recent papers.

Harper, Francis. THE MAMMALS OF KEEWATIN. U. Kans. Mus. Nat. Hist., Misc. Publ. no. 12. 1-94 p., 6 pls., 9 figs. Oct. 1956. 75¢ from Arctic Inst. N. Am., 1530 P St. NW., Wash. 5, D. C.

Harper studied and collected animals near Nueltin Lake in sw. Keewatin for 6 months in 1947. Several papers, including a large one on caribou, have already appeared. The present paper is an account of the author's collections

and observations combined with information from local people. 34 species are discussed and 13 other species of terrestrial mammals from Keewatin are treated briefly. Species accounts vary in length, but typically include notes on local abundance, habitat, sign, reproduction, measurements, molt, coloration, and behavior. Subspecific identifications are discussed. A valuable feature of the paper is the summary of locality records that is given for each species. These list the known distributional records for Keewatin and adjacent areas. Ectoparasites are treated in detail, with data given in text and in a special checklist. Pathology is recorded for species in which it was noted. Bibliography of 6 pages.

Schiller, Everett L., and Robert Rausch. (Rausch: Arctic Health Res. Center, Anchorage, Alaska.) MAMMALS OF THE KATMAI NATIONAL MONUMENT, ALASKA. Arctic 9(3): 191-201, 1 map. 1956.
Annotated list.

Sealander, John A., Jr. (U. Ark.) A PROVISIONAL CHECK-LIST AND KEY TO THE MAMMALS OF ARKANSAS (WITH ANNOTATIONS). Am. Midl. Nat. 56(2): 257-296, 1 map. Oct. 1956.
Good, up-to-date list with detailed locality records. Annotations discuss status and general abundance, habitat, subspecies, introductions and reintroductions, etc. The key is designed for general rather than critical work. A few points of special interest may be mentioned. Jackrabbits (L. californicus) are locally common and have extended their range in state. Beavers are now present in a number of places, thanks largely to restocking. Both red wolves (C. niger) and coyotes are common. Bears occur in several areas and seem to be increasing. There are some 700-800 otters in Ark. and they are slowly increasing. Apparently pumas were never exterminated in Ark.: one was killed in 1949 and many other records are reported here. Pumas may have increased with the deer. Bobcats are still common. A herd of introduced elk numbers about 200.

Smith, Donald A., and J. Bristol Foster. (U. Toronto.) NOTES ON THE SMALL MAMMALS OF CHURCHILL, MANITOBA. J. Mamm. 38(1): 98-115, 3 figs. Feb. 1957.
From authors' summary: "An annotated list includes 15 species... Published records are summarized and observations and comments on abundance, breeding, habitat, food and taxonomic status are presented for most of the species listed, and for several microtines in particular. Especially noteworthy is the report of an abundance of the phenacomys vole with a description of various details of its biology, hitherto poorly known. Changes in the numbers of microtines from summer to summer are noted. Voles increased markedly one year before lemmings became common; voles remained abundant for four consecutive summers, and long after the decline in lemming numbers."

MAMMALS--POPULATIONS, HOME RANGES, COMMUNITIES

Buckner, C. H. (For. Biol. Lab., Winnipeg, Man.) POPULATION STUDIES ON SMALL MAMMALS OF SOUTHEASTERN MANITOBA. J. Mamm. 38(1): 87-97, 3 figs. Feb. 1957.
Small-mammal populations were determined in 3 tamarack bogs by live trapping 4.9-acre plots. Seasonal and annual fluctuations of Sorex cinereus, Sorex arcticus, Clethrionomys gapperi, and Microtus pennsylvanicus are shown in graphs. Habitat preferences of these species are discussed. Results of several experimental trappings will be of particular interest to persons concerned with techniques. These are, in part: (1) Oatmeal and peanut butter baits were more effective than bacon rind or old cheese. Increased frequency of trap visits decreased mortality. Shrew mortality was further decreased by the addition of canned dog food plus Chlorpromazine to the bait. Shrew mortality was less in tumble-in traps than in Sherman traps. (2) By continuous snap trapping, it was possible to remove the entire small mammal population from a plot and keep it removed. (3) Several Clethrionomys utilized both sides of a road "barrier" as parts of their regular ranges; Microtus behaved similarly with regard to a rock outcrop. (4) Lincoln index determinations of population size based on combined 3-day data gave estimates of population density consistent with those obtained by trapping until no new animals were taken. However, the estimates made use

of home-range data obtained from more extended live trapping.] (5) Estimates from snap-trap grids and lines were different from live-trap results in early summer, but were more nearly similar at other seasons. [Here too home range sizes calculated from long-term live trapping were used in making the estimates.] --L. F. Stickel.

Chitty, D., Helen Chitty, and P. H. Leslie. (Bur. Anim. Pop., Oxford U., Eng.) CHANGES IN THE RELATIVE SIZE OF THE NUCLEUS IN THE INTERVERTEBRAL DISCS OF STRESSED ORKNEY VOLES (MICROTUS ORCADENSIS). J. Pathol. & Bact. 72(2): 459-470. 1956.

From summary: Object was to find out whether stress causes increase in relative size of nucleus of intervertebral disc. (It has been suggested that this occurs in man.) Young male voles were put into contact with an old mated pair for about 2 hours a day for 3-12 days. Fighting, chasing, and superficial wounding occurred. More severely wounded animals, in comparison with their litter-mate controls, had higher liver, spleen, adrenal, and body weights, smaller thymus, and relatively larger nucleus in intervertebral disc. Less severely wounded animals also had higher body weights than had controls, and they had slightly higher adrenal weights; otherwise they did not differ consistently from controls.

Christian, John J., and David E. Davis. (Naval Med. Res. Inst., Bethesda 14, Md.) THE RELATIONSHIP BETWEEN ADRENAL WEIGHT AND POPULATION STATUS OF URBAN NORWAY RATS. J. Mamm. 37(4): 475-486, 3 graphs. Nov. 1956.

Relationships between weights of adrenal glands and population status were tested on free living populations in favorable habitats in Baltimore. Population status was defined as low stationary, low increasing, high increasing, high stationary and decreasing. Population status was determined by successive scat censuses, and the first sample of rats from a given block was taken at one of the higher stages. The low stages were produced by removal trapping. Adrenal weights were adjusted for body weight and tested for correlations. Changes in pituitary glands and thymus glands were considered also. The authors' discussion points up unsolved problems of adrenal relationships encountered in the study. They conclude that "...there is a density-dependent stimulus to the pituitary-adrenocortical system of wild Norway rats that operates independently of season or supplies of the usual environmental necessities."--L. F. Stickel.

Curry-Lindahl, Kai. (Nordiska Museet and Skansen, Stockholm, Sweden.) HABITATS, HOME RANGES, MIGRATIONS AND PERIODICITY IN SOME SMALL MAMMALS. Fauna och Flora (Uppsala, Sweden) 1956(5/6): 193-218. 1956.

Swedish; 3.5-p. summary and legends in Eng. Tables show (1) numbers of small mammals of 6 species trapped in 6 different habitats; (2) numbers of each species taken in the forest each year, 1945-55, and the number of traps and trap nights; (3) population peaks of Swedish small mammals, 1943-54, as derived from the author's work and from literature. The summary describes habitat preferences and interspecies relationships of species mentioned below and of Sorex araneus and Sorex minutus. Apodemus sylvaticus and A. flavicollis may move their headquarters several times a year, depending, perhaps, on food supply. Similarly, Microtus agrestis migrates regularly between different habitats. "The home ranges of Apodemus sylvaticus and A. flavicollis with their many site holes are used as refuges in a collective way for each species, which apparently is of survival value for both of them. There are site ranges and feeding grounds; the latter can be used collectively by several 'clans' (groups of mouse families belonging to a certain site)." "Clethrionomys glareolus moves about very regularly in its home range keeping a certain time-table and following special, highly frequented pathways. This is also characteristic of the other rodents dealt with in this paper, and is a rather well-known fact." Small mammal population peaks occurred in the n. mountainous parts of Sweden in the years 1941-42, 1945-46, 1948-50, and 1953. Peaks subsequent to the 1941-42 high were less widespread and pronounced. On the Norwegian side of the same mountains the peaks corresponded to the Swedish ones except that 1944-45 and 1948-49 peaks were pronounced and widely distributed. Peaks of population occurred also in s. Sweden but were not correlated with the cycles in the north.--L. F. Stickel.

Davis, David E., and John J. Christian. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) CHANGES IN NORWAY RAT POPULATIONS INDUCED BY INTRODUCTION OF RATS. J. Wildl. Mgt. 20(4): 378-383, 3 graphs. Oct. 1956.

Author's summary: "Wild Norway rats...were introduced from one city block to another to simulate immigration. The population changes were determined by frequent estimates for about 20 weeks before introduction and 8 to 11 weeks thereafter. From two blocks with stationary rat populations, some rats were removed and then replaced by aliens. The populations remained stationary. In two blocks about four times as many rats were introduced as were removed. The populations declined about 25%. In four blocks with increasing populations about one fourth of each population was removed and replaced by alien rats from other blocks. The increase halted. The reproductive rate 8 to 11 weeks after the introduction was normal for an increasing population, but the lactation rate was low, indicating that the decline in population growth was due in part to a decreased reproductive rate, and that the population was back to normal pregnancy rate in two months. The adrenal weights were also essentially normal for the population level two months after introduction."

Davis, David E., and John J. Christian. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) RELATION OF ADRENAL WEIGHT TO SOCIAL RANK OF MICE. Proc. Soc. Exp. Biol. & Med. 94(4): 728-731, 1 fig. Apr. 1957.

Summary: "Mature male 'wild-strain mice,' isolated from weaning, were placed in groups of 6 for 4 hours a day for 10 days. The social or dominance rank of each mouse was determined. Adrenal and body weights were obtained for each mouse. A significant relationship was found between adrenal weight and social rank. It is concluded that high-ranking mice have smaller adrenals than do low-ranking mice."

Dawson, Janet. (Bur. Anim. Pop., Oxford U., Eng.) SPLENIC HYPERTROPHY IN VOLES. Nature 178(4543): 1183-1184. Nov. 24, 1956.

Stress situations tend to produce spleen enlargement in voles. Both enlarged and normal spleens of M. agrestis were studied histologically. "There is... clear evidence of a haemolytic process in those animals with splenic hypertrophy. This condition is indicated by the large amounts of accessory erythropoietic tissue in the spleen, the high reticulocyte counts, and the low haemoglobin-levels. However, the exact relationship between spleen size, reticulocyte count, and haemoglobin content appears to be complex, and depends on the body weight and sex of the animal, and probably on the particular stage of the condition reached. The aetiology of the haemolytic process is as yet unknown."

Edwards, R. Y. (B. C. For. Serv., Victoria.) ON THE ABUNDANCE OF LARGE PREDATORS IN BRITISH COLUMBIA. Murrelet 37(3): 28-30, 2 graphs. Sept.-Dec. 1956.

"Cougar data and some wolf data, mainly from Vancouver Island, appear to be influenced by ungulate abundance, severe winters, or both. The correlation is the opposite to that suggested by the known ecology of these predators. These bounty figures and game warden reports suggest predator abundance when ungulates are scarce. Province-wide wolf bounty data have no such agreement with ungulate data. There is no explanation for the spectacular increases in wolves bountied in the 1930's, nor for the large number bountied throughout the 1940's. Perhaps the most important outcome is the ability to ask questions not previously recognized as meaningful. Have bounty figures any simple relationship with size of wild populations? Are abundance reports from casual observation of predators accurate indices of actual abundance? How does ungulate abundance affect the abundance of large predators? We have considered these questions to have obvious answers. Perhaps the obvious was an illusion."

Gentry, John B., and Eugene P. Odum. (U. Ga.) THE EFFECT OF WEATHER ON THE WINTER ACTIVITY OF OLD-FIELD RODENTS. J. Mamm. 38(1): 72-77, 1 fig. Feb. 1957.

A significant analysis of effects of weather on catch and catch trends of the 3-night snap-trap line. Data from 53 traplines in 41 different fields are presented in tables and graphs to show catch trends for 5 major weather conditions. Peromyscus polionotus was the principal species in the catch. When weather was clear and cool throughout, the catch declined each night. When weather was warm and cloudy throughout, the catch declined each night, but a larger proportion of mice were caught the first night and a smaller proportion the last night, resulting in a steeper downward trend. When weather changed from cool-clear to

warm-cloudy the second night, a sharp rise in catch occurred. A change to warm-cloudy the third night also produced an upward trend. A change from cloudy to clear resulted in a change in rate which also indicated a decline in catch in clear weather. Traps in 32 lines that were operated for 2 or more clear-cold nights av. 4.8 animals per trapline, while 21 lines with 2 or more cloudy-warm nights averaged 6.3 mice per trapline. These comparisons, while very suggestive, were not statistically significant. The authors conclude that the use of a ratio between first and second night captures in calculating density is not satisfactory for these trapping data. The reviewer believes this paper points up just one of the many difficulties involved in obtaining reliable population data from a trapline, particularly a trapline from which the animals are removed by snap-trapping.--L. F. Stickel.

Louch, Charles D. (Hope Coll.) ADRENOCORTICAL ACTIVITY IN RELATION TO THE DENSITY AND DYNAMICS OF THREE CONFINED POPULATIONS OF MICROTUS PENNSYLVANICUS. Ecol. 37(4): 701-713, 5 figs. Oct. 1956.

High populations were accompanied by increased adrenocortical activity. Direct cause probably was higher incidence of fighting in high populations. Factors that brought about population decline appeared to be increased litter mortality and adult mortality. Litter mortality was related to aberrant maternal behavior apparently brought about by disturbance of lactating females, which could not isolate themselves. Higher adult mortality was caused by increase of infectious disease in high populations. "It is suggested that the animals of the high population were in the Resistance Phase of the General Adaptation Syndrome (GAS) in response to the stress factor of fighting and so were more susceptible to infectious disease... A theoretical shift of anterior pituitary activity in the Resistance Phase of the GAS toward the production of ACTH and away from the production of the gonadotrophins and prolactin may partially explain the aberrant maternal behavior and thus part of the litter mortality..."

MAMMALS--PARASITES AND DISEASES

Allred, D. M., G. N. Stagg, and J. F. Lavender. (Ecol. Res., U. Utah, Dugway, Utah.) EXPERIMENTAL TRANSMISSION OF PASTEURELLA TULARENSIS BY THE TICK, DERMACENTOR PARUMAPERTUS. J. Infect. Dis. 99(2): 143-145. Sept.-Oct. 1956.

Banfield, A. W. F. (Can. Wildl. Serv., Ottawa.) AN INVESTIGATION OF TICKS AS DISEASE VECTORS IN BANFF NATIONAL PARK, ALBERTA. Can. J. Zool. 34(5): 417-423, 1 map. Oct. 1956.

From abstract: 238 Dermacentor andersoni and 7 D. albipictus were collected from 17 localities in the spring of 1953. Virus of Colo. tick fever was found in 3 of 17 lots. One of 19 complement-fixation tests was significantly positive for Rocky Mtn. spotted fever Rickettsia. There was no indication of tularemia. Unfed adults of D. andersoni were active April 20-June 22. The bighorn sheep was the common host of adults. Citellus columbianus was the common host of nymphs.

Jameson, E. W., Jr., and James M. Brennan. (U. Calif., Davis.) AN ENVIRONMENTAL ANALYSIS OF SOME ECTOPARASITES OF SMALL FOREST MAMMALS IN THE SIERRA NEVADA, CALIFORNIA. Ecol. Monog. 27(1): 45-54, 1 graph. Jan. 1957.

Rausch, Robert, and Everett L. Schiller. (Arctic Health Res. Center, Anchorage, Alaska.) STUDIES ON THE HELMINTH FAUNA OF ALASKA. XXV. THE ECOLOGY AND PUBLIC HEALTH SIGNIFICANCE OF ECHINOCOCCUS SIBIRICENSIS RAUSCH & SCHILLER, 1954, ON ST. LAWRENCE ISLAND. Parasitology 46(3/4): 395-419, 2 pls., 3 figs. Nov. 1956.

This Eurasian worm, not E. granulosus, is the cause of alveolar hydatid disease in man. Great effort should be made to prevent introduction of the worm into N. Am. The paper tells what should be done and gives much information on hosts and pathology in man and animals.

Richards, S. H., and D. F. Eveleth. (N. Dak. Agr. Coll.) PRELIMINARY INVESTIGATIONS WITH A LYMPHOCYTIC CHORIOMENINGITIS-LIKE VIRUS RECOVERED FROM CATTLE. Vet. Med. 52: 167-168, 174. Apr. 1957.

Evidence, some of it gathered since this article was written, indicates that skunks are vectors of this disease that killed 3 head of cattle in N. Dak. Material from the cattle produced disease in skunk, raccoon, white mouse, and guinea pig.

Sweatman, G. K., and P. J. G. Plummer. (Can Dept. Agr., Macdonald Coll., Montreal, P. Q.) THE BIOLOGY AND PATHOLOGY OF THE TAPEWORM TAENIA HYDATIGENA IN DOMESTIC AND WILD HOSTS. Can. J. Zool. 35(1): 93-109, 12 figs. Feb. 1957.

Voge, Marietta. (Sch. Med., U. Calif., Los Angeles.) A LIST OF NEMATODE PARASITES FROM CALIFORNIA MAMMALS. Am. Midl. Nat. 56(2): 423-429. Oct. 1956.

Provides list of nematodes for each host species and list of hosts for each nematode species.

SHREWS, MOLES, BATS

Bell, J. Frederick, W. J. Hadlow, and Wm. L. Jellison. (Rocky Mtn. Lab., Hamilton, Mont.) A SURVEY OF CHIROPTERAN RABIES IN WESTERN MONTANA. Pub. Health Rep. 72(1): 16-18. Jan. 1957.

All of 121 bats collected while roosting were free of rabies. Three of 6 that exhibited abnormal behavior were rabid. Rabid bats were Myotis californicus, Eptesicus fuscus, and Lasiurus cinereus.

Crowcroft, Peter. (Brit. Mus. Nat. Hist., London.) ON THE LIFE SPAN OF THE COMMON SHREW (SOREX ARANEUS L.). Proc. Zool. Soc. London 127(2): 285-291, 2 sets graphs. Oct. 1956.

Summary: "1. Common Shrews...were caught...from August 1949 until November 1951. The animals were weighed and measured and the lower canine teeth were measured to provide an index of age. 2. The dimensions and reproductive condition of successive samples provide evidence that the Common Shrew does not normally breed in the year of birth, and dies before the end of the following year. 3. The complete annual turnover of the Common Shrew population is confirmed by comparing the tooth wear of mature and immature animals. Individuals caught during the winter are neither sexually mature, nor do they have teeth as worn as those of mature animals."

Hough, Fred. (John Burroughs Nat. Hist. Soc., Accord, N. Y.) SET HUNTING PATTERN OF A LITTLE BROWN BAT. J. Mamm. 38(1): 121-122. Feb. 1957.

Myotis lucifugus followed a stereotyped feeding-flight pattern through observations on 17 Oct. evenings.

Quist, K. D., R. B. Eads, and Alice Conklin. (U. S. Pub. Health Serv., Austin, Texas.) STUDIES ON BAT RABIES IN TEXAS. J. Am. Vet. Med. Assn. 130(2): 66-68. Jan. 15, 1957.

Summary: "Studies indicate that bat rabies virus is infectious and invasive in other mammalian species, including man."

Rice, Dale W. (US F&WS, Midway Is., Terr. Hawaii, c/o Navy 3080, FPO San Francisco.) LIFE HISTORY AND ECOLOGY OF MYOTIS AUSTRORIPARIUS IN FLORIDA. J. Mamm. 38(1): 15-32, 3 figs. Feb. 1957.

Fla. distribution of these bats consists of 2 separate areas, 1 in w. Fla., 1 in peninsular Fla. In w. Fla. the bats hibernate in caves and mate primarily in fall, as in most other parts of the species' range. In peninsular Fla. the bats are active most of the winter and mate primarily in the spring. Temperature and food supply seem to produce these differences. In spring the pregnant females and some males gather in large maternity colonies of 2,000-90,000 bats where young are born about the second week of May. Most males and non-breeding females roost outside caves (peninsular Fla.) or in other caves (w. Fla.). Population density in n. peninsular Fla. was 77 per sq. mi. before the young were born and up to 167 per sq. mi. when young were on the wing. Males comprised 51% of the population at birth, 43% of the adult population in w. Fla. and 39%

of the population in peninsular Fla. Young av. 1.9 per female per year. Recaptures of banded bats were mostly in the same caves, but a few were as far as 27 miles away. Some homed up to 45 miles. Ectoparasites are listed. Rat snakes, opossums, some owls, and cockroaches (preying on young) were chief predators.--L. F. Stickel.

Roth, Charles E. (U. Conn.) NOTES ON MATERNAL CARE IN MYOTIS LUCIFUGUS. J. Mamm. 38(1): 122-123. Feb. 1957.
Observations in captivity and under natural conditions of birth of young and abandonment, except for nursing, of young within a short time of birth.

Sluiter, J. W., P. F. van Heerdt, and J. J. Bezem. (U. Utrecht, Netherlands.) POPULATION STATISTICS OF THE BAT MYOTIS MYSTACINUS, BASED ON THE MARKING-RECAPTURE METHOD. Archives Néerlandaises de Zoologie Tome 12: 63-88, 6 maps & graphs. 1956.
Population data were derived from bat banding studies made in 18 sampling caves in Southern Limburg, The Netherlands, during a period of 13 years. Sex ratios remained fairly constant at 1 male : 0.74 female. Annual mortality rates were 20% for adults and about 40% for young of less than 6 months. Life span was calculated as 20 years, mean longevity as 5 years. Conclusions were derived from statistical analysis of recapture records. Calculation methods and also a method of checking the accuracy of the calculations by the use of artificial populations and IBM punch cards, are described in detail.--L. F. Stickel.

Smith, Elizabeth. (U. Cincinnati.) EXPERIMENTAL STUDY OF FACTORS AFFECTING SEX RATIOS IN THE LITTLE BROWN BAT. J. Mamm. 38(1): 32-39. Feb. 1957.
Males comprised 1.03% of 3768 bats captured. Equal numbers of males and females were born; sex of offspring was not affected by the ovary (right or left), difficulties in pregnancy, number of erythrocytes or hemoglobin level in mother, time of fertilization, chronological order of birth, or weights or ages of mother. Sex ratios varied widely with season as juvenile males left the roosts and did not return.--L. F. Stickel.

Tjalma, R. A., and B. B. Wentworth. (U. Iowa.) BAT RABIES--REPORT OF AN ISOLATION OF RABIES VIRUS FROM NATIVE OHIO BATS. J. Am. Vet. Med. Assn. 130 (2): 68-70. Jan. 15, 1957.
In tests of Eptesicus fuscus, 1 pool of brain material was positive. "A clarification or understanding of the host-parasite relationship existing between the bat and the rabies virus may well have a profound effect on our conception of rabies as an infectious disease."

RABBITS AND PIKAS

Anon. MYXOMATOSIS IN AUSTRALIA. Nature 178(4544): 1219. Dec. 1, 1956.
Brief report of a C.S.I.R.O. conference of Sept. 18, 1956. Australian rabbit populations are extremely low. Prime cause is myxomatosis but heavy rainfall and use of 1080 are also responsible. 1080 has been highly successful. Less virulent strains of myxomatosis are now dominant in the wild in both Australia and Europe. Highly virulent strains are to be widely disseminated in Australia to compete with them and to reduce numbers of genetically resistant rabbits, which are appearing. Introduction of Eur. rabbit flea to provide good, new carrier is under consideration. Landholders are urged to take advantage of the current low in rabbits to use 1080 and all other means to kill off all survivors. "The aim must be to eradicate the rabbit from Australia." [Yet the same species of rabbit is being spread over the U. S. and little is being done about it.]

Barnes, Wm. B. (Ind. Dept. Cons.) STATUS OF THE SAN JUAN RABBIT IN THE MIDWEST. Trans. 17th Midwest Wildl. Conf., Lafayette, Ind. 1-7 p., mimeo. 1955.
Questionnaires were mailed to the member states of the Midwest Wildl. Conf. and answers were received from Ohio, Ind., Mich., Wis., Ill., Mo., and Iowa. Releases reported: Ohio, several thousand; Mich., several hundred; Ill., number unknown; Wis., 18; Ind., less than 500. Survival, as far as known, was poor.

Principle pressure for releases came from beagle clubs, some from other hunters. Legal aspects of the rabbit importation and release problem are discussed at some length. Four states reported local hutches breeding rabbits for release; the author believes that these may be the main source in the future. Consequently he emphasizes that laws or rulings should be designed primarily to prohibit releases, not merely importations.--L. F. Stickel.

Bouvier, G., H. Burgisser, and P. A. Schneider. MONOGRAPH OF DISEASES OF HARES IN SWITZERLAND. (Monographie der Hasenkrankheiten in der Schweiz). Lausanne, Switzerland. Pages not stated. 1954. [From German abstract by Mendheim in Z. Jagdwissenschaft 1(3).]

Contains sections on tumors, poisons, parasitic, viral, and bacterial diseases. Scab mite does not affect the hare. Myxomatosis is practically unknown in Switzerland. 17% of dead animals died from bacterial infections of which rodent TB plays an important role since 35% of all dead hares exhibited this. Brucellosis was found in 10% of the hares. Bacterial diseases are well described and illustrated but this is not so in other sections, where descriptions are inadequate for diagnostic reference. Lacks a summary and has a poor bibliography. --V. F. Flyger.

Bowers, Glenn L. (Pa. Game Comm.) HELPING BEAGLE CLUBS PRODUCE MORE COTTONTAILS. Proc. NE. Sec. Wildl. Soc. et al. 1-3 p., mimeo. Jan. 1957. [Also in Pa. Game News 28(4): 17-21.]

Cottontails are now hard to buy in quantity so beagle clubs are taking more interest in habitat improvement in their own areas. The Pa. Game Comm. provides guidance and sometimes planting stock. Food plantings are grown next to good cover. One form is bluegrass and clover in strip up to 15' wide, limed and fertilized as necessary. The strip is mowed periodically to maintain succulence. Plots of grass-legume mixtures, also clipped rotationally, are broken up by spot or strip plantings of conifers or shrubs. Cover is created by cutting woods edge to width of at least 50'. Fence rows and the like are also cut here and there to provide cover of brush and vines. Half-cutting is especially useful. For beagling purposes, all cutting and other cover creation should form an interrupted pattern. Networks of trails are highly desirable on beagle field trial areas. These trails can be worked into the habitat improvement plan. The whole idea of habitat management is relatively new to beaglers and few groups have carried out plans really well.

Bull, P. C., and R. H. Taylor. THE INFLUENCE OF HOST AGE IN PARASITISM OF WILD RABBITS. Proc. New Zealand Ecol. Soc. no. 3: 29-30. Mar. 1956. [From J. Mamm. 38(1).]

Carrick, R. (Wildl. Surv. Sec., C.S.I.R.O., Canberra, Aust.) RADIOIODINE AS AN INDICATOR OF FREE-FEEDING ACTIVITY OF THE RABBIT, ORYCTOLAGUS CUNICULUS (L.). C.S.I.R.O. Wildl. Res. 1(2): 106-113, 2 graphs. Dec. 1956.

Summary: "The use of ^{131}I to obtain qualitative and rough quantitative data on the intake of carrot bait by individual rabbits...during field enclosure experiments on free feeding was investigated. In laboratory tests, the rapid concentration of varying amounts of ^{131}I in the thyroid, followed by steady loss, was measured with a Geiger counter applied externally to the throat. It was established that oral intake of 2μc ^{131}I could be readily detected for 2 days, and that the minimum rate of labelling should be 1μc of ^{131}I per 5 g carrot. A successful field enclosure trial was done. Observations of behaviour revealed no adverse effects due to radiation from the larger amounts of ^{131}I or to capture and handling of the rabbits."

Dell, Joseph. (N. Y. Cons. Dept.) TOE CLIPPING VARYING HARES FOR TRACK IDENTIFICATION. N. Y. Fish & Game J. 4(1): 61-68, 3 photos. Jan. 1957.

From author's abstract: "The method involves the surgical removal of no more than one toe-end on each hind foot to produce readily identifiable notched footprints in snow. Up to 24 hares can be so marked without duplication... By thus introducing a known quantity into a population, track surveys might be used to determine abundance levels." The method also permits tracking studies of home ranges and travels.

Dell, Joseph. (N. Y. Cons. Dept.) THE EUROPEAN HARE (LEPUS EUROPAEUS) IN NEW YORK STATE. Proc. NE. Sec. Wildl. Soc. et al. 1 p., mimeo. Jan. 1957.
Abstract of preliminary findings of current study. Introduced around 1893, hares became serious orchard pests by 1915 but declined in numbers and range, perhaps in 1930s. Increase in numbers and range resumed about 1950. No crop damage is now reported and hare range hardly overlaps orchard district. Hares seem to compete only slightly with cottontails. Hare is highly prized as game and flesh is nearly equal to that of cottontail. Present range in N. Y. is 3 isolated colonies and is spreading slowly, with most spread in e.-central N. Y. s. of Mohawk R. Probably a high proportion of population is shot each year. Chief habitat is dairy country. Major winter foods are listed. Weights of 20 hares av. 8 lbs. 13 oz. (7 lbs. to 9 lbs. 11 oz.). Evidence is given that reproductive activities occur Jan. through March.

Dell, Joseph. (N. Y. Cons. Dept.) THE EUROPEAN HARE IN NEW YORK. N. Y. State Cons. 11(4): 28-29, 4 figs. Feb.-Mar. 1957.
History, present controversial status in state, and notes on life history and economics. Covers much, but not all the ground of Dell's similar paper, "The European hare (Lepus europaeus) in New York State," Proc. NE. Sec. Wildl. Soc. et al., Jan. 1957.

Ecke, Dean H. (Santa Clara Co. Health Dept., San Jose 28, Calif.) MINIMUM LETHAL TEMPERATURE FOR THE COTTONTAIL PARASITE EIMERIA ENVIRON. J. Wildl. Mgt. 20(4): 459-460. Oct. 1956.
Experiments were conducted under laboratory conditions to determine the lower lethal temperatures for Eimeria environ, a common parasite of cottontails in Ill. It was found that 48 hours at a temperature of -15°C. proved fatal to 100% of exposed coccidia. The implications are that cold weather would destroy much of the infection in contaminated ground; conversely, a mild winter could permit a massive build-up of viable oöcysts and might result in high mortality of young rabbits from coccidiosis during the following spring.--Author.

Geis, Aelred D. (Patuxent Research Refuge, Laurel, Md.) INCIDENCE AND EFFECT OF WARBLES ON SOUTHERN MICHIGAN COTTONTAILS. J. Wildl. Mgt. 21(1): 94-95, 1 graph. Jan. 1957.
Seasonal and yearly degrees and fluctuations were determined in the incidence of the dipterous larvae (Cuterebra horripilum Clark), commonly called warbles, in cottontails. Effects of warbles included decreased growth rate, increased white-blood-cell counts, general weakness, and, at least occasionally, death. Seriousness of infestation seemed to be influenced by age of host, number of warbles infecting rabbit, and location at which warbles developed.--Author.

Geis, Aelred D. (Patuxent Refuge, Laurel, Md.) NORMAL BLOOD CELL COUNTS FOR THE COTTONTAIL RABBIT. J. Mamm. 38(1): 136. Feb. 1957.

Geis, Aelred D. (Patuxent Refuge, Laurel, Md.) COPROPHAGY IN THE COTTONTAIL RABBIT. J. Mamm. 38(1): 136. Feb. 1957.
Five of 22 rabbits shot contained fecal pellets in stomachs.

Jacotot, H., A. Valée, and B. Virat. STUDY OF EXPERIMENTAL TRANSMISSION OF MYXOMATOSIS IN THE HARE. Annales de l'Institut Pasteur 88(1). Pages not stated. 1955. [From German abstract by Eickhoff in Z. Jagdwissenschaft 1(4).]
In French. Three rabbits which were found dead in 1953 were the source of the myxomatosis virus. Hares were extremely difficult to infect. Only one of 13 hares died of myxomatosis. The virus could be reclaimed only from the injection site and testes. Among rabbits only 10 out of 1000 experimental animals were refractory to myxomatosis.--V. F. Flyger.

Janes, Donald W. (U. Kans.) BODY TEMPERATURE IN THE EASTERN COTTONTAIL. J. Mamm. 38(1): 137. Feb. 1957.
Av. range of normal body temperature of 169 free-living individuals trapped, shot, or caught by hand: 102.0° to 105.5° F.

Keith, L. B., and J. D. Waring. (U. Alberta, Edmonton.) EVIDENCE OF ORIENTATION AND HOMING IN SNOWSHOE HARES. Can. J. Zool. 34(6): 579-581, 1 map. Dec. 1956.

Abstract: "A total of 54 marked snowshoe hares (Lepus americanus) was released in a study conducted from May, 1951, to March, 1956, near Anzac, Alberta. These animals were collected within a 10-mile radius of the Waring cabin at Anzac, and following eartagging all were released at this site. As a result, some hares were liberated several miles from their home range, while others were freed on familiar ground. Twelve of the 54 tagged hares were subsequently retaken in snares set by local inhabitants. Data gathered from these recoveries indicate that after release, hares were able to orient their movements toward the home range... The three hares failing to do so came originally from areas separated from the release point by sections of a large lake, and thus were denied a direct route of return."

Koenen, F. THE HARE (Der Feldhase). A. Ziemsen Verlag, Wittenberg-Lutherstadt. 80 p. 1956. 3.75 DM. [From German abstract by Walter Rieck in Z. Jagdwissenschaft 2(3).]

In German. A summary of knowledge of Eur. hare. Contains sections on names, fables, hares with horns, hares and rabbits, anatomy, molt, malformations, aberrant colors, scent glands, droppings, tracks, locomotion, speed, habits, behavior, reproduction, hybridization, nutrition, enemies, diseases and parasites, distribution and species and races of genus Lepus.--V. F. Flyger.

Lazarus, Marian. (20 Hawthorn Ave., Chatswood, N. S. W.) THE TOXICITY AND RELATIVE ACCEPTABILITY OF SOME POISONS TO THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.). C.S.I.R.O. Wildl. Res. 1(2): 96-100. Dec. 1956.

Summary: "Laboratory tests of nine substances already in use or considered suitable...showed that only sodium fluoroacetate ("1080") seems to have any considerable advantage over strychnine and phosphorus." Chemicals tested and rejected, but on which data are given, are: potassium cyanide, thiosemicarbazide, Hexone (HETP and TEPP), parathion, zinc phosphide, and arsenic trioxide.

Negus, Norman Curtiss. A REGIONAL COMPARISON OF COTTONTAIL RABBIT REPRODUCTION IN OHIO. Ph.D. thesis, Ohio State U. 158 p. 1956. [From abstract in Dissertation Abstracts 16(1).]

Comparisons were made of litter sizes, weights, and lengths and weights of humeri from samples of rabbits taken from good and poor soil types in Ohio. Bluegrass samples from the same areas were analyzed for calcium and phosphorus content. Techniques of litter size determination from microscopic sections, and embryo aging, were derived from studies of New Zealand White rabbits and applied to studies of cottontails. Results are not discussed in the abstract.--L. F. Stickel.

Peterson, Roger Tory. THE GREAT NATURAL EXPERIMENT. Aud. Mag. 58(6): 248, 250-251, 287. Nov.-Dec. 1956.

Popular review of effects of myxomatosis epizootics on Eur. rabbits. Rabbits in Britain had economic value of some $84,000,000 a year, but damage done by them amounted at least $168,000,000 and probably much more. Now that rabbits are scarce in England, the annual increase in grass crops alone is valued at $42,000,000. Forests have shown much regeneration and many rare flowers have become much more common. One orchid considered extinct has reappeared. In France, forests are able to regenerate for the first time within memory. In Holland, dune-fixing vegetation has been favored dramatically. In Australia, grass grows where there were near-deserts; fields that supported 1 sheep now feed 2 cows; the 1952-53 increase in sheep production was worth more than $84,000,000. The foxes and certain hawks of Eur. and Britain have been forced to switch their diet to birds, fishes, and mice; also, their reproduction seemed to decline, or even cease. Scientists suspect that weaker strains of myxomatosis will become prevalent and that some rabbits will survive. Rabbit populations are not expected to attain their former high levels.

Redd, John B. (Va. Comm. Game.) LIVE TRAPPING AS A TECHNIQUE OF ESTIMATING RABBIT ABUNDANCE. Presented at Va. Acad. Sci., Richmond, Va., May 4, 1956. 7 p., 3 graphs., mimeo. 1956.

Live traps were operated for a 10.5-month period on a 327-acre area. Rabbits were trapped more readily in Oct. and Nov. than in other months. Lincoln Index calculations of population size from a shot sample exceeded estimates made from capture-recapture records, but data on actual population size were not available to show which were more nearly correct. The author believes that approximately 40% of the estimated population should be handled in order to obtain satisfactory estimates from recapture formulae. Indices of abundance considered of value are listed. "This investigation indicates that there is a great need for a statistical evaluation of the accuracy of both the take-retake formulae and indices methods of estimating animal populations when such estimates can be compared with a known population."--L. F. Stickel.

Redd, John B., Jr. (Va. Comm. Game.) A CLOSER LOOK AT THE COTTONTAIL RABBIT. Va. Wildl. 17(12): 18-19, 25, 3 photos. Dec. 1956.

General, popular article with section on management. "Two things can be done to assist in the production of a greater number of rabbits on a given area of land: (1) encourage cover of adequate density for use by rabbits at all seasons of the year, this cover being so distributed throughout the area that the rabbit does not have to go more than 200-300 feet from protective cover to feed; (2) provide food during all seasons of the year, but particularly during the winter and early spring. This may be done by properly placed field crops or by food plantings made especially for the use of rabbits." Cover can be provided in the form of brush piles, logs, unmowed areas, fenced-off woodlots or odd areas, and vegetated fence rows. Plantings of rye or winter wheat yield green winter food. Piles of orchard prunings can give both winter food and cover. Adequate food and cover during all seasons, and open areas interspersed with brush areas, mean more rabbits.

Rothschild, Miriam, and Harry Marsh. (Ashton Wold, Peterborough, Eng.) INCREASE OF HARES (LEPUS EUROPAEUS PALLAS) AT ASHTON WOLD, WITH A NOTE ON THE REDUCTION IN NUMBERS OF THE BROWN RAT (RATTUS NORVEGICUS BERKENHOUT). Proc. Zool. Soc. London 127(3): 441-445, 1 map. Nov. 1956.

Some surprising events have followed virtual extermination of European rabbits by myxomatosis in Britain. Rabbits and hares had not been considered competitors, yet within 18 months after the rabbit die-off hares increased markedly at Ashton Wold and occupied what had been primary rabbit habitat. Part of the increase apparently represented influx. Foxes, which were abundant and deprived of a chief food, were unable to hold down the hares. It is suspected, however, that foxes and other predators may have caused an unprecedented drop in rat populations that was observed. A French correspondent also reports increase of hares after loss of rabbits.

Rowley, Ian. (Wildl. Surv. Sec., C.S.I.R.O., Canberra, Aust.) FIELD ENCLOSURES FOR THE STUDY OF THE WILD RABBIT, ORYCTOLAGUS CUNICULUS (L.). C.S.I.R.O. Wildl. Res. 1(2): 101-105, 1 fig. Dec. 1956.

Summary: "Groups of wild rabbits...were successfully established in netted enclosures which measured 7-1/2 and 3-3/4 acres, at a density of four to five rabbits per acre. They settled down within 2 weeks of introduction, and established constant behaviour patterns which appeared to resemble the normal. Artificial burrows were readily used. Anti-predator precautions and a grid system for recording rabbit movements are described."

Rowley, Ian. (Wildl. Surv. Sec., C.S.I.R.O., Canberra, Aust.) COPROPHAGY IN THE RABBIT, ORYCTOLAGUS CUNICULUS (L.) IN TASMANIA. C.S.I.R.O. Wildl. Res. 1(2): 133, 1 fig. Dec. 1956.

Sheffer, Dale E. (Md. Game Comm., Bel Air.) COTTONTAIL RABBIT PROPAGATION IN SMALL BREEDING PENS. J. Wildl. Mgt. 21(1): 90. Jan. 1957.

Breeders were stocked in pens of 50 x 50 ft. and supplied with food, water, and cover. In the first year "A total of 167 young rabbits was produced from seven females in the four pens, or an average of 23.9 per female. The average size of each litter was 4.8 among 35 litters... The sex ratio of adults used in each pen varied from 1:1 to 1:3... The high production was probably due to the feeding of high-protein pellets, very little human or animal disturbance, no nest disturbance, and removal of the young seven to ten days after their leaving the nest." A variety of factors caused loss of 36 of the 167 young.

Sheldon, Bill. (U. Mass.) SNOWSHOE HARE IN MASSACHUSETTS. Mass. Wildl. 8(1): 12-15, photo. Jan.-Feb. 1957.

Summary of a detailed Coop. Wild. Res. Unit study made by W. A. Fitzpatrick and John Boyle. "A more detailed report is available from the Wildlife Department at the University of Massachusetts." History and cost of Mass. stocking are reviewed. Evergreen habitat is most important to hares; the five principal types are described. Live trapping studies in several areas stocked in Jan. showed 22 of 65 hares surviving 1 month after release. Released hares were found to take 3 months to attain a weight equal to that of natives. Survival to hunting season the year after stocking was 12%, whereas survival of native hares over the same period was 65%. In 1 area all hares were removed by trapping and shooting (success checked by lack of snow tracks); a year later the area had been repopulated by natural invasion of native hares; the same number was taken as in preceding year. Fisheries & Game Board policies adopted include stocking after the hunting season and only in areas devoid of hares or greatly undersupplied.--L. F. Stickel.

Thompson, Harry V., and Alastair N. Worden. THE RABBIT. (New Naturalist Spec. Vol.) Wm. Collins, Sons & Co., London. xii + 240 p., 8 pls. 1956. 16s. [From review by R. M. Lockley, Nature 179(4550).]

Substantial monograph on wild Oryctolagus cuniculus, which must be the best-known of rabbits. "This is an important book, bringing as it does right up to date the latest research on both the rabbit and myxomatosis, as well as a full chapter on the legal aspects of rabbit control, as pest and game." Among subjects discussed are: history, distribution, anatomy, re-ingestion, aging by apophysial gap at head of tibia, pseudo-pregnancy, prenatal mortality, and other matters. Steel trapping catches males first and thus results in fine annual crop instead of control; abolition of the method is recommended. There was strong evidence of a 9-11 year cycle in British rabbits before myxomatosis. Present scarcity of rabbits may benefit hares, for they share some diseases and compete for food. Low rabbit numbers are expected to prevail in Britain for years; forestry and agriculture will profit. "The authors consider that it is doubtful if natural predators are of importance in the control of rabbits except in special circumstances."

RODENTS--MISCELLANEOUS

Allred, Dorald M. (U. Utah.) MITES FOUND ON MICE OF THE GENUS PEROMYSCUS IN UTAH. II. FAMILY HAEMOGAMASIDAE. Proc. Ent. Soc. Wash. 59(1): 31-39, 31 figs. Feb. 1957.

Anon. MICE CONTROL. Soil Cons. 22(6): 128. Jan. 1957.

Four years of tests reported by L. G. Holm and F. A. Gilbert of U. Wis. indicate that apple trees are not damaged by mice [presumably Microtus] when an area of 3-foot radius around each tree is kept vegetation-free with herbicide. Two teaspoons of CMU are mixed into 2 gallons of water and applied with sprinkling can at rate of 10 lbs. per acre. Application should be made before July 1 to control vegetation. Apple trees of fruit-bearing age are not harmed by the treatment but younger ones may be.

Bartholomew, George A., and Tom J. Cade. (U. Calif., Los Angeles.) TEMPERATURE REGULATION, HIBERNATION, AND AESTIVATION IN THE LITTLE POCKET MOUSE, PEROGNATHUS LONGIMEMBRIS. J. Mamm. 38(1): 60-72, 13 figs. Feb. 1957.

Conclusions from authors' summary: "(1) In this species aestivation and hibernation are the same physiological phenomenon. (2) Torpidity is an important factor in allowing this species to meet both short-term and seasonal periods of environmental stress. (3) The lability of body temperature and the range of body temperatures over which normal activities can be maintained make the designation of a single 'normal' body temperature of doubtful physiological meaning for this species."

Buckner, C. H. (For. Biol. Lab., Winnipeg, Man.) HOME RANGE OF SYNAPTOMYS COOPERI. J. Mamm. 38(1): 132. Feb. 1957.

Cruising range of 105-118 ft. in 7 captures, e. Man.

Criddle, Stuart. (Aweme, Treesbank, Man.) DRUMMOND'S VOLE IN MANITOBA. Can. Field-Nat. 70(2): 78-84, 1 photo. Apr.-June 1956 [Apr. 1957].

Summary of trapping and observations on Microtus p. drummondii, 1928-1950. Tables give measurements of voles collected in different places in Man., collection totals by age and sex each year from 1928, greatest monthly catch each year, and reproductive data. Subjects discussed include: breeding and young, nests, fluctuations, food habits, swimming, fighting, economic status, and control.--L. F. Stickel.

Davis, David E. (Johns Hopkins Sch. Hygiene, Balt. 5, Md.) A COMPARISON OF NATALITY RATES IN WHITE-FOOTED MICE FOR FOUR YEARS. J. Mamm. 37(4): 513-516. Nov. 1956.

P. leucopus were snap-trapped in late Sept. 1950-53 in an oak woods in s. N. J. There was no detectable change in size of population, judging from catches. The proportion pregnant varied from 33 to 55. Litter size varied from 4.40 to 4.87. Size at maturity (as defined here) differed in various years. Small mice had lower reproductive rates than large mice. It is concluded that in spite of some changes in reproductive rates the population remained essentially unchanged in numbers.

De Coursey, G. E., Jr. (U. Wis.) IDENTIFICATION, ECOLOGY AND REPRODUCTION OF MICROTUS IN OHIO. J. Mamm. 38(1): 44-52, 11 figs. Feb. 1957.

From author's summary: "Dentition was the only consistently satisfactory feature found for distinguishing Microtus pennsylvanicus from Microtus ochrogaster ohioensis. Identification of most specimens was possible by means of the pelage and measurements, but this method was not infallible. The Microtus population was relatively scarce during the summer of 1953 and the early summer of 1954. During this time the population was concentrated in the drainage ditches and marshy spots and was made up mostly of M. pennsylvanicus. During the winter of 1953-54 a large population of Microtus, composed chiefly of M. ochrogaster, was present in the field. The average litter size of M. pennsylvanicus was 4.48; that of M. ochrogaster was 3.40. There is some evidence that reproduction in M. ochrogaster is at least sometimes limited by the absence of fertile males."

Dingle, Richard Wm. (State Coll. Wash.) POCKET GOPHERS AS A CAUSE OF MORTALITY IN EASTERN WASHINGTON PINE PLANTATIONS. J. For. 54(12): 832-835, 9 figs. Dec. 1956.

Thomomys killed up to 30% of young ponderosa pines in a 2-3-year period. Damage was caused mainly by pruning roots, but some whole plants were destroyed. Scotch pines were also attacked. Placement of strychnine-treated carrot cubes in burrows gave good control and was followed by rebaiting or trapping to get remaining individuals.

Drummond, Roger Otto. OBSERVATIONS ON THE FLUCTUATIONS OF ACARINE POPULATIONS FROM NESTS OF PEROMYSCUS LEUCOPUS. Ph.D. thesis, U. Md. 126 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]

139 species of mites were associated with these nests.

Frank, Fritz, and Klaus Zimmermann. ZUR BIOLOGIE DER NORDISCHEN WÜHLMAUS (MICROTUS OECONOMUS STIMMINGI NEHRING). Z. Säugetierk. 21(1/2): 58-83, pl. 5. 1956. [From J. Mamm. 38(1).]

Gottschang, Jack L. (U. Cincinnati, Ohio.) JUVENILE MOLT IN PEROMYSCUS LEUCOPUS NOVEBORACENSIS. J. Mamm. 37(4): 516-520, 1 fig. Nov. 1956.

Molt progress was studied in juv. mice born from wild-caught pregnant females and kept in outdoor cages under natural conditions. Typical molt pattern is figured and variations described. Molting dates are correlated with age; time of molt completion is more variable. No correlation was found between body weight and molt.--L. F. Stickel.

Hagen, Brigitte. EINE NEUE METHODE DER ALTERBESTIMMUNG VON KLEINSÄUGERN. Bonner Zool. Beitr. 6(1/2). Reprint paged 1-7 + fig. on unnumbered p. 1955.

Describes method of aging Microtus arvalis by degree of ossification of tail vertebrae. Lengths of ossified and cartilaginous portions are compared to estimate age. [The method appears to have potentialities in studies of game mammals]--C. W. Lemke.

Hagen, Brigitte. ALTERSBESTIMMUNG AN EINIGEN MURIDEN-ARTEN. Z. Säugetierk. 21(1/2): 39-43. 1956. [From J. Mamm. 38(1).]

Holdenried, R., and S. F. Quan. (Chem. Corps Res. & Devel. Command, Dugway Proving Ground, Utah.) SUSCEPTIBILITY OF NEW MEXICO RODENTS TO EXPERIMENTAL PLAGUE. Pub. Health Rep. 71(10): 979-984, 1 fig. Oct. 1956.
21 species of wild rodents were tested. They varied widely in susceptibility; some were completely resistant. Four species trapped in plague and plague-free areas showed no difference in susceptibility between areas.

Howard, W. E., B. L. Kay, J. E. Street, and C. F. Walker. (U. Calif., Davis.) RANGE RODENT CONTROL BY PLANE. Calif. Agr. 10(10): 8-9, 3 figs. Oct. 1956.
Explains the techniques and reports on 2 tests in Calif. Bait consisted of 3 ounces of 1080 per 100 lbs. of oats. Desired dosage was 3-4 kernels per sq. ft. near center of each swath. One lb. or 1/2 lb. per acre was considered adequate. Swaths averaged about 21 yards in width. Reduction of rodents in the 2 tests was 87% and 97% after 11 and 35 days.

Howell, J. F., D. M. Allred, and D E. Beck. (U. Utah.) SEASONAL POPULATION FLUCTUATIONS OF MITES IN DESERT WOOD RAT NESTS IN CENTRAL UTAH. Ecol. 38(1): 82-88, 6 figs. Jan. 1957.

Kinoshita, Eijiro. STUDIES ON THE MECHANICAL CONTROL OF FIELD MICE. IV. ON THE EFFECT OF CONTROL OF FIELD MICE BY TRENCH. Rep. Hokkaido Branch, Govt. For. Exp. Sta., Spec. Rep. no. 5. p. 50-62. Jan. 1956. [From J. Mamm. 38(1).]
In Japanese with English summary. The issue of the J. Mamm. cited also lists parts I and II of this series; they have identical titles and were published in the same series in 1954 and 1955.

Laycock, William A. (U. Wyo.) SEASONAL PERIODS OF SURFACE INACTIVITY OF THE POCKET GOPHER. J. Mamm. 38(1): 132-133. Feb. 1957.
Thomomys talpoides, Jackson Hole region, Wyo.

Meanley, Brooke, and Robert M. Blair. (P. O. Box 1365, Alexandria, La.) DAMAGE TO LONGLEAF PINE SEEDLINGS BY COTTON RATS. J. For. 55(1): 35. Jan. 1957.
Content similar to that of Meanley, Mann, and Derr, which see.

Meanley, Brooke, Wm. F. Mann, Jr., and H. J. Derr. (P. O. Box 1365, Alexandria, La.) COTTON RATS DAMAGE LONGLEAF SEEDLINGS. Forests & People 6(4): 42-43, 2 photos. 4th quarter 1956.
About 10% of longleaf pine seedlings in a 400-acre planting were killed by cotton rats. The rats nipped off or girdled the seedlings at or just below ground level. The area had a heavy grass cover, favorable to Sigmodon. Seedlings over 2 feet tall were rarely attacked. Slash and loblolly pines were attacked by cotton rats much less often than longleaf. If damage is found in late fall or winter, prescribed burning is recommended. Damage in spring and fall requires use of poisoned baits.

Miller, Lotus Simon. (U. Calif., Davis.) TRACING VOLE MOVEMENTS BY RADIOACTIVE EXCRETORY PRODUCTS. Ecol. 38(1): 132-136, 2 figs. Jan. 1957.
From author's summary: "An adult male meadow vole was trapped from a population...injected with 200 microcuries of P^{32} and released at the point of capture. Small aluminum squares, laid out over an acre in a grid pattern were examined...each day for radioactive excretory products. During eight days after injection, radioactivity was detected a total of sixteen times, at eleven different stations which encompassed about one-fourth of an acre."

Perrotta, Carmie Ann. FETAL MEMBRANES OF THE CANADIAN PORCUPINE, ERETHIZON DORSATUM, LINNAEUS. Ph.D. thesis, U. Wis. 166 p. 1956. [From Dissertation Abstracts 16(1).]
Also treats certain other aspects of female reproductive system.

Pfeiffer, E. W. THE MALE REPRODUCTIVE TRACT OF A PRIMITIVE RODENT, APLODONTIA RUFA. Anat. Record 124(4): 629-635. April 1956. [From J. Mamm. 38(1).]

Roth, Charles E. (U. Conn.) DISTRIBUTION OF THE PORCUPINE IN CONNECTICUT. J. Mamm. 38(1): 133-135, 1 map. Feb. 1957.
Porcupines were found to be more widespread than generally believed. The population is thought to be increasing and spreading, thanks largely to city people who buy rural land and encourage trees and wildlife.

Steven, D. M. (Univ. Coll. of W. Indies, Jamaica.) THE BANK VOLE IN CAPTIVITY. Nature 179(4549): 33-34. Jan. 5, 1957.
Reproduction in Clethrionomys glareolus.

Tevis, Lloyd, Jr. (U. Calif., Davis.) EFFECT OF A SLASH BURN ON FOREST MICE. J. Wildl. Mgt. 20(4): 405-409, 2 photos. Oct. 1956.
A 16-acre cutover in a Douglas-fir forest near Salyer, Trinity Co., Calif. was live-trapped for 5 days prior to a slash burn and was snap-trapped for 2.5 weeks thereafter. The objective was to determine if fire could be used to control seed-eating mice (Peromyscus maniculatus and P. truei) which hinder reforestation. The fire killed or drove out all residents except the few that stayed on small areas not reached by flames. There was no reinvasion of the cutover until rain settled the ashes. Then, 72 new mice were trapped. This was nearly twice the original number of marked animals. Therefore, a slash burn does not control mice.--Author.

Verts, B. J. (S. Ill. U., Carbondale.) THE POPULATION AND DISTRIBUTION OF TWO SPECIES OF PEROMYSCUS ON SOME ILLINOIS STRIP-MINED LAND. J. Mamm. 38(1): 53-59, 3 figs. Feb. 1957.
Two periods of snap trapping showed that P. m. bairdii had a higher population and a higher proportion of juveniles in the winter-spring period than in the summer-fall period. Numbers and proportions of P. leucopus juveniles were approximately the same in the two periods. "P. m. bairdii was the predominate form in the most recent strippings, but decreased in dominance with the increased age of the spoils. The percentage of P. leucopus in the total catch increased with the age of the strippings and became the only species of Peromyscus taken in areas mined previous to 1936. Plant composition seemingly was not a factor in the distribution of these mice, as no measurable differences were found in species composition between the earliest and latest strippings." --L. F. Stickel.

Watson, Adam. (U. Aberdeen, Scotland.) ECOLOGICAL NOTES ON THE LEMMINGS LEMMUS TRIMUCRONATUS AND DICROSTONYX GROENLANDICUS IN BAFFIN ISLAND. J. Anim. Ecol. 25(2): 289-302. Nov. 1956.
Digest from author's summary: Both species were abundant in 1953, but with considerable local variation, even in one valley. Relative numbers of the 2 species also varied in different parts of the island and in the same area from year to year. Population fluctuations of the 2 are often independent and not in phase. Dicrostonyx preferred dry heathy slopes. Lemmus reached great abundance in the flat, moist areas of the valley floor, where Dicrostonyx did not occur, but also occurred in some numbers on the slopes. Serious vegetation damage resulted from high numbers in summer. Snowy owls were common and reared large broods, which were fed almost entirely on lemmings. Their density was closely correlated with lemming density.--L. F. Stickel.

Wing, Leonard W. (3875 Vorhies Rd., Ann Arbor, Mich.) TIME CHART MEASUREMENTS OF NORWEGIAN LEMMING AND RODENT CYCLES. J. Cycle Res. 6(1): 3-15, 6 graphs. Jan. 1957.
Summary: "The cycle commonly thought to be about four years in the Lemmings ..., Mice (Mus), and Rodents...(1871-1949) have been measured by means of time charts for different regions of Norway. These show the cycle to be of the same length over all of Norway: 3.86 years. The timing is substantially the same for the groups of animals in the several regions so far as it can be determined with available data. It is probable that other cycles influence the 3.86-year cycle, particularly one of 3.65-3.80 years that appears rather clearly in the more recent data. No other cycles have been measured because it seems likely that gaps in the record of outbreaks can be filled in from the literature. Additional data before 1871, nearly continuous to 1823 and fragmentary to 1578, give a 'backcast' that confirms results obtained with the 1871-1949 data. They indicate that the length of the cycle is about 3.862 years long."

RATTUS AND MUS

Dykstra, Walter W. (US F&WS.) NEW WEAPONS FOR RODENT CONTROL. Pest Control 25(1): 16, 18, 20. Jan. 1957.
Diphacinone is the most active anticoagulant yet proposed for use as a rodenticide; it is now under test. The problem of marginal feeders can be solved by attractive baits; 1 excellent bait consists of freshly-ground corn meal, 25% rolled oats, 5% sugar, and 5% corn oil, with 0.01% malathion to prevent insect infestation. Acceptance of water-type anticoagulant baits is increased by adding 5% sugar; such baits are more attractive to some rats than solid baits. Excellent results have been obtained in new tests of tracking powders containing 2% of an anticoagulant. House mice were well controlled with tracking powder containing 700-800 mg./kg. of red squill. Use of tracking powders must be made with consideration of possible contamination of human or animal foods. Reports indicate value of 50% DDT dust in control of bats in such places as attics.

SCIURIDS

Clark, Gordon Marston. STUDIES ON THE LIFE CYCLE OF A NEW SPECIES OF HEPATOZOON. Ph.D thesis, U. Md. 136 p. 1956. [From abstract in Dissertation Abstracts 16(12).]
In gray squirrel, Md.

Hibbard, Edmund A. (N. Dak. Game Dept., Windsor.) RANGE AND SPREAD OF THE GRAY AND FOX SQUIRRELS IN NORTH DAKOTA. J. Mamm. 37(4): 525-531, 2 maps. Nov. 1956.
Discusses present distribution, immigration routes, and introductions. The fox squirrel, a recent invader, now has a wide range in N. Dak. and is still spreading. The gray squirrel also has expanded its N. Dak. range greatly in recent years.

Irving, F. D., J. R. Beer, and O. F. Hall. (U. Minn.) SUGAR MAPLE BARK INJURY BY GRAY SQUIRRELS IN A MINNESOTA WOODLOT. Minn. For. Notes no. 54. 2 p., 3 figs. Oct. 1956.
Describes injuries and gives data on sizes of stems attacked. Damage may be extensive but is chiefly limited to stems of 0.5-6". Some stems are girdled, others simply scarred. Importance of the damage is not yet clear, but is thought to vary. The damage might be an automatic thinning device, or it might simply result in many low-value trees.

Rice, Dale W. (US F&WS, Midway Is., Terr. Hawaii, c/o Navy 3080, FPO San Francisco.) SEXUAL BEHAVIOR OF TASSEL-EARED SQUIRRELS. J. Mamm. 38(1): 129. Feb. 1957.
Observations of mating behavior in S. aberti and of defense of tree against others of own species.

Uhlig, Hans G. (P. O. Box 358, Fergus Falls, Minn.) SQUIRRELS--A $40 MILLION BUSINESS. W. Va. Cons. 21(1): 12-14, 2 photos. Mar. 1957.
W. Va. gray squirrel population is valued at $40 million, or $8 per acre of suitable habitat. The estimate is based on an annual expenditure of $2 million by hunters, calculated to be a 5% return on capital investment. Recommended hunting season opening date is Oct. 15 to allow the summer brood to become grown. This is especially important since the summer litter is the main basis of the fall population. Incidence of warbles is also low by this date.--L. F. Stickel.

BEAVER

Blanchet, Maurice. LE "MARQUAGE" PROBABLE DU TERRITOIRE, CHEZ LE CASTOR DU RHONE. La Terre et la Vie (Paris) 102(4): 329-335, illus. Dec. 1955. [From J. Mamm. 37(3).]

Bond, Charles F. (U. of Vt.) CORRELATIONS BETWEEN REPRODUCTIVE CONDITIONS AND SKULL CHARACTERISTICS OF BEAVER. J. Mamm. 37(4): 506-512, 2 figs. Nov. 1956.

Reproductive tracts and skulls of 2164 beavers trapped in Vt. were studied. Sex ratio was 108 males : 100 females, but in carcasses weighing over 30 lbs. it was 84 males : 100 females. Males that had just attained sexual maturity had bacula av. 24 x 3.9 mm.; their carcasses weighed 15-19 lbs. Females of less than 24 lbs. (carcass) had no embryos. Trapping occurred early in breeding season; embryos were few and small but corpora lutea were numerous. Probable causes are discussed. "The incidence of corpora albicantes in females taken in the first year of trapping was 41.2 percent, compared with 28.5 and 27.4 per cent in the next two years. This decrease, it is believed, resulted from trapping the males of mated pairs just prior to copulation." Statistical work on skulls tied other characters to zygomatic breadth because the latter is easily measured in field. No sexual dimorphism in skulls was found. Correlation between baculum length and zygomatic breadth was 0.72. Skull dimensions correlated well with baculum length in transition to maturity. "This indicates that the most probable condition of the skull and reproductive tract of an animal may be predicted when the zygomatic breadth is known. The use of the frequency distribution plot of zygomatic breadth as a means of keeping track of changes in the composition of a large population is suggested."

Hay, Keith G., and Wm. H. Rutherford. (Colo. Game Dept.) A GUIDE TO BEAVER TRAPPING AND PELTING. Colo. Dept. Game & Fish, Tech. Bul. no. 3. 1-21 p., 26 figs. Oct. 1956.

In 1956, Colo. had its first beaver-trapping season in 70 years. The present bulletin is a good, practical, well-illustrated pamphlet designed to tell trappers just what the Colo. laws about beaver are, what equipment is needed for beaver trapping, how to make the best types of sets, how to skin the animals, and how to prepare the pelts for market.

Linnamies, Olavi. ON THE INCIDENCE OF AND DAMAGE CAUSED BY BEAVERS IN FINLAND. Suomen Riista 10: 63-86, 12 figs. 1956.

In Finnish. English abstract on separate, mimeo. sheet. Although the paper is principally about damage done by beaver to forests, it contains other interesting data. Beavers, having been exterminated in Finland, were reintroduced from Norway (Castor fiber) and from Canada (C. canadensis). The Canadians were distinctly more vigorous in reproduction. But the 2 "species" interbred and produced fertile offspring.

Neff, Don J. (632 N. 28th St., Corvallis, Ore.) ECOLOGICAL EFFECTS OF BEAVER HABITAT ABANDONMENT IN THE COLORADO ROCKIES. J. Wildl. Mgt. 21(1): 80-84. Jan. 1957.

Abandonment by beavers of numerous pond sites on Chavez Creek, Saguache Co., Colo., was studied in relation to its effects on vegetative recovery and production, wildlife use, and physical environments of sites. Comparison was made with a nearby stream, Nutras Creek, that still supported a large beaver population. Abandonment resulted in nearly complete loss of the aquatic environment in spite of the highly stable, glaciated terrain. Trout and aquatic wildlife were abundant on the occupied stream, rare on abandoned sites. Water-storage capacity of abandoned ponds was nil. Vegetative recovery was rapid in drained ponds; these produced more herbaceous vegetation but less browse (Salix spp.) than comparable occupied pond sites.--Author.

MUSKRAT AND NUTRIA

Adams, William H., Jr. (Ala. Poly. Inst.) THE NUTRIA IN COASTAL LOUISIANA. Proc. La. Acad. Sci. 19: 28-40, 5 figs. Nov. 1956.

Distribution in U. S. states and foreign countries, weights and measurements, growth and age determination, age classes, sex ratio, reproduction, litter size, injuries, movements. For author's abstract of thesis on which this paper is based, see WR 85: 30.

Anon. SPOTLIGHTING NUTRIA PROMOTION. Natl. Fur News 28(10): 26, 38. Nov. 1956.

The old "breeding stock" racket is in full swing with nutria. Rearing of these animals is advertised as a get-rich-quick-in-your-own-backyard type of business. Nutria are not so easily reared as often represented and the market for their pelts is poor. One N. Y. fur dealer states: "In fact, there is no market and it is practically impossible to sell nutria. We have large holdings of nutria in cold storage in New York and overseas and are eager to dispose of them for prices below cost. Up to now we have found no takers." Despite this condition, the promoters of breeding-stock sales are planning to extend their activities to the e. part of the U. S. The Better Business Bureau has issued a warning, reprinted in the present article, in the Sept. 1956 issue of its publication "Safeguard." This warning is perhaps less firm than it might have been. From all information seen for Wildlife Review, prospects for financial success in rearing nutria for pelts are practically zero and much of the advertising for breeding stock is highly misleading. Furthermore, it seems extremely dangerous to risk having more colonies of nutria become established in the wild.

Nicholson, Wm. R., and David E. Davis. (Davis: Johns Hopkins School Hyg., Baltimore 5, Md.) THE DURATION OF LIFE OF MUSKRAT HOUSES. Ecol. 38(1): 161-163, 1 graph. Jan. 1957.

Digest from author's summary: Houses built per month were about the same during the fall but increased greatly in Feb. and then practically stopped. 69 houses built from Sept.-Dec. persisted about 7.7 months, whereas houses built in Feb. lasted only 3.5 months. Predation on muskrats by raccoons was negligible during the study (1952-53). Work was done on and near Blackwater Refuge, Md.

Reeves, Henry M., and Roger M. Williams. (US F&WS, P. O. Box 1786, Harlingen, Texas.) REPRODUCTION, SIZE, AND MORTALITY OF THE ROCKY MOUNTAIN MUSKRAT. J. Mamm. 37(4): 494-500. Nov. 1956.

Summary: "The Rocky Mountain muskrat, Ondatra zibethicus osoyoosensis (Lord), was studied on two large marshes, Gray's Lake and Dingle Swamp, in southeastern Idaho. Young muskrats were born from late May to mid-August at Gray's Lake and from early May to late August at Dingle Swamp. Thirty-five complete Gray's Lake litters ranged from 2 to 9 and averaged 7.0 young; 33 Dingle Swamp litters varied from 5 to 10 and averaged 7.3 nestlings. Breeding females at Gray's Lake produced an average of 11 young, approximately 1.6 litters per season, and Dingle Swamp breeders, 19 young, with 2.4 litters per season. Barrenness in females appeared to be unimportant at both localities. A sex ratio of 143 males : 100 females was determined for 4,963 animals. A fall ratio of 386 subadults : 100 adults and 403 subadults : 100 adults was established at Gray's Lake and Dingle Swamp, respectively. The methods for aging by pelt primeness pattern and external examination of genitalia were found valid for fall-trapped muskrats. Subadult mortalities from time of birth to fall were calculated to be 16 and 47 per cent for Gray's Lake and Dingle Swamp. Muskrats of southeastern Idaho appear to be among the smallest in the United States."

Sather, J. Henry. (W. Ill. State Coll.) SKULL DIMENSIONS OF THE GREAT PLAINS MUSKRAT, ONDATRA ZIBETHICUS CINNAMOMINUS. J. Mamm. 37(4): 501-505. Nov. 1955.

Summary: "The mean dimensions of both young and old muskrats are slightly larger for males than for females. The least variable dimension of adult males is the cranial width, and of adult females the zygomatic width. The least variable dimensions of subadult males are cranial width and condylo-alveolar length; whereas, the least variable dimensions of subadult females are the total skull length and zygomatic width. The greatest difference in skull dimensions of muskrats of the same age taken during their first winter was .8 mm."

Shomon, J. J. (Va. Comm. Game.) MILLION DOLLAR RAT. Va. Wildl. 17(12): 7-9, 26, 3 photos. Dec. 1956.

General, popular article on muskrat. "Canada shows some big yields in muskrats. Her production has steadily improved through a policy of intelligent management of muskrat marshes on government reservations. Reports from Manitoba, Quebec and Ontario tell of amazing government rehabilitation work on marshes where muskrat yields have been increased by better than 1000 percent. As an illustration, one Manitoba area of 54,000 acres of marshland several years back

had a 'rat population of 300. After four years of wise management wherein the water levels were controlled, the area produced a population of 60,000 'rats. Similarly on the Summerberry Game Preserve, the government increased the muskrat population from 5,000 to 72,000 in two years and no fewer than 200,000 in three years." In contrast, little is done in the U. S. to manage the muskrat resource.

Stieve-Miegel, B. SUPERFETATION IN THE MUSKRAT. Z. Mikrosk.-Anat. Forschg. 61(1): 82-92. 1955. [From German abstract by Mendheim in Z. Jagdwissenschaft 2(3).]

In German. Four cases of superfetation were found in 91 females examined. In bicornuate uteri, 1 horn can remain unoccupied, permitting superfetation in the other, because follicle ripening occurs throughout pregnancy.—V. F. Flyger.

Wingard, Bob. (Pa. State U.) REPORT ON NUTRIA. Pa. Game News 28(1): 56-58, 1 photo. Jan. 1957.

Rearing captive nutria for fur has been a financial failure in Europe, Argentina, and the U. S. But sale of breeding stock continues. Wild nutria have increased in the U. S. while prices for their pelts have declined so much there is little incentive to trap them. The animals have not been satisfactory in clearing ponds of vegetation. They have done much damage by burrowing in levees and around bridge piers and by eating crops. Released or escaped nutria have turned up in the wild in states across the country, including Pa.

FUR ANIMALS, GENERAL

Cook, Arthur H. (N. Y. Cons. Dept.) THE FUTURE IN FURS. N. Y. State Cons. 11(2): 20-21, 2 figs. Oct.-Nov. 1956.

Fur buyers report a low in demand for wild furs. Silver fox farms are gone. Pelt prices do not pay for trapping of most fur species. Synthetic furs are invading the market and are almost sure to improve and take more of the fur business. The future of the fur trade is black and the prospects of getting economical control of troublesome fur animals are dim.

Quick, Horace Floyd. (U. Maine.) THE FUR RESOURCE OF A WILDERNESS REGION IN NORTHERN BRITISH COLUMBIA. Ph.D. thesis, U. Mich. 210 p. 1956. [From long abstract in Dissertation Abstracts 16(12).]

Pelt prices of furs taken on the 20,000 sq. mi. area amounted to $10 per sq. mi. in 1947-48. Beaver furs contributed 80% of the gross income and marten 15%. "The population status, level of exploitation, and economic value of ten important species are discussed." Beaver were under-utilized in the muskeg zone, more fully utilized in foothills and mountain zones. Production of marten furs could be increased 25% without endangering breeding stock. The author recommends management of the fur resource by the government and the fur trade on the basis of biological principles. "Economic conditions dominated biological factors affecting resource management. The fur trade should examine this condition and do everything possible to stabilize the raw fur market."--L. F. Stickel.

Williams, Roger M. (Idaho Game Dept.) THE IDAHO FUR RESOURCE. Idaho Wildl. Rev. 9(4): 8-12, 4 figs. Jan.-Feb. 1957.

Tables show Idaho fur catch, by species, 1945-55, and total catch and its value for each year of this decade. Another table shows av. annual catch, by species, for each county. Text discusses importance and pelt-price fluctuations of the various species and standing of Idaho as a fur-producing state.

BEARS

Bersing, Otis S. (Wis. Cons. Dept.) WISCONSIN BLACK BEAR. Wis. Cons. Bul. 21(10): 25-28, 1 photo. Oct. 1956.

Legal status, approximate numbers killed, weights of a few exceptionally large bears, damage done by bears. The public is interested in having a stable bear population maintained.

Black, Hugh C. (Cornell U.) PRELIMINARY REPORT ON THE BLACK BEAR INVESTIGATION IN NEW YORK STATE. Proc. NE. Sec. Wildl. Soc. et al. 1-15 p., mimeo. Jan. 1957.

Discusses: live trapping techniques using culvert trap, use and advantages of steel wolf traps in live trapping bears, use of ether to anesthetize bears in culvert traps, handling steel-trapped bears with choker and ropes, and ear tags. Succinylcholine chloride was used successfully to give quick, temporary immobilization. It was injected with a syringe on a 7-ft. rod. Nicotine salicylate apparently is expected to be even better. Bears trapped to time of writing total 61. Weights are reported for 54 of them, by age groups. Recoveries of 4 marked bears after about 2 months indicated travels of about 1-8 miles.

Black, Hugh, and Nick Drahos. (Cornell U.) A BEAR BY THE TAIL. N. Y. State Cons. 11(2): 28-29, 8 photos. Oct.-Nov. 1956.

Tells how bears are trapped, etherized for study, and transported. Gives weights, by sex and age groups, for 54 N. Y. bears.

Condin, David de L. (Yellowstone Natl. Park.) THE YELLOWSTONE GRIZZLY. Wyo. Wildl. 20(12): 8-15, 8 photos. Dec. 1956.

General account of habits, numbers, and control in Yellowstone Park. Two adult males weighed 497 and 590 lbs.; 3 adult females weighed 346, 340, and 375. These are considered representative; occasional individuals are larger. Females commonly have 2-3 cubs, less often 1 or 4. The bears tend to travel in family groups. Groups of young may run together up to age of 5 years. Fights are few but sometimes fatal. Grizzlies can attain speeds just over 30 m.p.h. Published estimates of 844 grizzlies in U. S. are considered excessive. The future of the species in the U. S. is dim unless attitudes and policies change. Analysis of Yellowstone data indicates that there are about 120-180 grizzlies in the park, and that this number is fairly stable. Only 8 people have been injured and 1 killed by grizzlies in Yellowstone history, although millions of people use the park. Troublesome individuals are live trapped or shot.

Richards, Elmer V. (Va. Comm. Game.) SOME BEAR FACTS. Va. Wildl. 18(3): 8-10, 3 photos. Mar. 1957.

Tables show numbers of bears killed in Va., by regions, 1949-55, and the kill during deer season, 1953-55. Killing bears in the deer season was prohibited in the 1956 season. State bear population is estimated at 2000. One tagged bear homed 85 miles to within 4 miles of the place where first captured. Original tagging was done in June 1955, and the bear was shot in Nov. 1955.--L. F. Stickel.

Spencer, H. E., Jr. (Maine Dept. Game.) THE BLACK BEAR--BIG GAME? VERMIN? OR FURBEARER? Proc. NE. Sec. Wildl. Soc. et al. 1-15 p., mimeo. Jan. 1957.

Mainly a presentation of certain data from author's 1955 publication, Maine Game Div. Bul. 4 (see WR 83: 30). The present paper reviews distribution in Maine, numbers, bounty, damage claims, economic value, and the problem of what legal status is desirable. The Game Division hopes to move gradually toward making the bear a game animal, with first steps being attempts to have bounty removed, continuation of damage payments, and publicizing the bear as game.

Stickley, Allen R. (Va. Poly. Inst.) AN INVESTIGATION OF FACTORS AFFECTING THE BEAR KILL IN VIRGINIA. Presented at Va. Acad. Sci., Richmond, Va., May 4, 1956. 5 p., 2 figs., mimeo. 1956.

"...although weather and mast conditions undoubtedly affect bear kill, available information indicates that a decline in the bear population is perhaps an important reason for the drop in black bear kill in Virginia the past two years. Shortening the season and eliminating bear hunting during deer season are two possible corrective measures that may be expected to help maintain the bear population in the State in the face of the constantly increasing hunting pressure."

RACCOON, RINGTAIL, COATI

Schultz, Vincent. (U. Md.) STATUS OF THE RACCOON IN TENNESSEE. J. Tenn. Acad. Sci. 31(4): 263-267, 2 maps. Oct. 1956.
Distribution, general abundance (by type-of-farming regions), and hunting importance. Highest populations seem to be in parts of w. and cent. Tenn. and lowest in mountainous e. section. Data derived from statewide interview survey.

Woehler, E. E. (Wis. Cons. Dept.) HOW ABOUT RACCOON STOCKING? Wis. Cons. Bul. 22(4): 12-14, 1 photo. Apr. 1957.
Wis. is the only state that still stocks raccoons. The animal is abundant in Wis. and av. annual stocking of 633 individuals from game farms makes no real difference. All evidence suggests that the stocking is futile and not even very popular with sportsmen. Suggested alternatives are: (1) transplanting from areas of abundance, as done in N. C.; (2) improve habitat with nest boxes; (3) popularize 'coon hunting where 'coons are already common.

MUSTELIDS

Helmericks, Bud. THE LIES THEY TELL ABOUT WOLVERINES! Field & Stream 61(9): 34-36, 67-68, 1 fig. Jan. 1957.
After 15 years in wolverine country, the author is convinced that the cleverness, strength and destructiveness of wolverines is greatly exaggerated. Actually, wolverines are one of the easiest animals to trap and are easily held by even a good no. 1 rat trap. Strength of a wolverine seems to be no greater than that of any other animal of equal size. The musky odor of the animal is very slight, much less than that of a weasel. The wolverine is now protected like any other fur-bearer in Alaska and this protection came none too soon. Wolverines could be brought back in suitable wild areas of some parts of the U. S. if given a break under state laws and regulations.

Quick, Horace F. (U. Maine.) FOOD HABITS OF MARTEN (MARTES AMERICANA) IN NORTHERN BRITISH COLUMBIA. Can. Field-Nat. 69(4): 144-147. Oct.-Dec. 1955 [Dec. 1956].
Scats and contents of alimentary tracts were analyzed for 2 winters, 1947 and 1948. Results are discussed in relation to population levels of prey species. "The important food base complex during the most critical period of the year consists of red backed voles, deer mice, red squirrels and snowshoe hares. These animals vary in abundance but low levels did not appear to limit marten populations in northern British Columbia during 1947-1949."

Watzka, Mainz. THE RELATIONSHIP BETWEEN CORPORA LUTEA AND PROLONGATION OF GESTATION. Med. Monatsspiegel 4(2): 33. 1955. [From German abstract by Mendheim in Z. Jagdwissenschaft 1(3).]
In German. Studies on the ermine show 2 breeding periods. Ripe follicles and corpora lutea exist during the summer breeding season. During the winter breeding season, corpora lutea appear only if they did not exist during the summer season. Embryos resulting from summer mating remain free in the uterus during a 6-7 month resting period. In spring the resting corpora lutea become active, resulting in implanting of embryos on uterine wall. The gestation period is thus 8-9 months following summer mating but only 8 weeks following winter mating.—V. F. Flyger.

Webster, Gloria A., and R. W. Wolfgang. (McGill U., Macdonald Coll. P. O., Quebec.) ALARIA CANADENSIS SP. NOV. AND EURYHELMIS PYRIFORMIS SP. NOV. FROM THE SKUNK MEPHITIS MEPHITIS IN QUEBEC. Can. J. Zool. 34(6): 595-601, 7 figs. Dec. 1957.

Yeager, Lee E., and Jack D. Remington. (Colo. State U.) SIGHT OBSERVATIONS OF COLORADO MARTENS, 1950-1955. J. Mamm. 37(4): 521-524. Nov. 1956.
Discussion based on 66 sight records and other data. Population seems to have been increasing strongly. Probable cause was decreased trapping. Preponderance of sight records from mid-June to mid-August suggests that martens may be more active and diurnal at that time, which is believed to correspond to the overall breeding season. Sight records are tabulated by elevation and timber type. Largest number of records was for spruce-fir at 10,000-11,000'. Miscellaneous observations are also reported.

DOGS, WOLVES, FOXES

Behrendt, G. A CONTRIBUTION TO THE ECOLOGY OF THE RED FOX, VULPES VULPES. Z. Jagdwissenschaft 1: 113-145, 161-183, 13 figs. 1955.
In German, with long English summary. Author considers fox beneficial to agriculture. 40% of food is mice, amounting to 4000 mice per fox per year. Paper contains much detailed information on stomach analyses by sex and month. Types of burrows are described and illustrated. Discussions are given on effects of weather, mortality factors, home range, and relationship of food supply to population and range size. It is pointed out that den areas are often separate from hunting areas.--V. F. Flyger.

Cobnut, G. FOXES AND MYXOMATOSIS IN KENT. Oryx (London) 3: 156-157. 1955. [From J. Anim. Ecol. 25(2).]
"The majority of foxes appeared from stomach examinations to have gone over to an omnivorous diet. There is no sign of deterioration in health."

Hattingh, Ivan. (Min. of Agr., Hook Rise, Surbiton, Surrey, Eng.) MEASUREMENTS OF FOXES FROM SCOTLAND AND ENGLAND. Proc. Zool. Soc. London 127(2): 191-199, 2 graphs. Oct. 1956.
May be of value in studying origin of red foxes in e. U. S. or for other comparative work.

Koenen, F. THE RED FOX (Der Rotfuchs). Akademische Verlagsgesellschaft Geest & Portig K-G, Leipzig. 42 p. 1952. 1.50 DM. [From German abstract by Walter Rieck in Z. Jagdwissenschaft 2(3).]
A popular presentation containing the following sections: general information, distribution, structure, fur, skeleton, glands, senses, tail positions, intelligence, nutrition, economic value, manner of living, reproduction, tameness, diseases and enemies.--V. F. Flyger.

Schultz, Vincent. (U. Md.) STATUS OF RED AND GRAY FOXES IN TENNESSEE. J. Tenn. Acad. Sci. 31(4): 268-274, 4 maps. Oct. 1956.
Distribution, general abundance (by type-of-farming regions), and hunting importance. Based on statewide interview survey.

Wilcomb, Maxwell S. FOX POPULATIONS AND FOOD HABITS IN RELATION TO GAME BIRD SURVIVAL, WILLAMETTE VALLEY, OREGON. Oreg. Agr. Exp. Sta. (Corvallis), Tech. Bul. 38. 1-16 p., 1 graph. Dec. 1956.
Gray foxes were more abundant than reds on the Beaver Creek Refuge and in the Willamette Valley as a whole in 1947-48. Gray foxes were most numerous on the refuge in late March and late June; presumably they were attracted by penned pheasants in the first period and by ripening of orchard fruits in the second. For the most part they were not residents of the refuge, but entered from surrounding wooded and foothill areas. Digestive tracts and scats (220 samples) from various places in the Willamette Valley contained no pheasant. Data from these analyses are discussed and major spring and summer foods are graphed. Two releases of adult game-farm pheasants were made on the refuge. The released birds preferred running to flight as a means of escape and often attempted to hide by crawling partly into heavy grass, leaving their tails exposed, or crouched where there was no concealment. Two were captured by hand and some entered farm yards and ate with the chickens. Releases were made when fox pups were in the dens. Pheasant remains were found at 3 of 8 red fox dens and 1 of 3 gray fox dens. Food analysis of scats collected at dens is shown in a table. In the first release 45 birds were freed; the last known survivor was taken after 59 days; 11 predator-killed birds were recovered; 5 had been taken by gray foxes. There were 50 birds in the second release; the last known survivor was seen 120 days later; 14 predator-killed birds were recovered; 12 had been taken by red fox, 1 by gray. Two gray foxes and 1 red were trapped between the pheasant-release periods; fox tracks disappeared for a time, but this did not prevent fox predation on the second release.—L. F. Stickel.

CATS

Gashwiler, Jay S., and W. Leslie Robinette. (US F&WS, Ore. State Coll.) ACCIDENTAL FATALITIES OF THE UTAH COUGAR. J. Mamm. 38(1): 123-126, 2 photos. Feb. 1957.
Literature records and two personal observations of fatalities and injuries to cougar, most apparently sustained in pursuit or attack on prey.

CATS—Continued

Jordahl, Harold C. (Wis. Cons. Dept.) CANADA LYNX. Wis. Cons. Bul. 21(11): 22-26, 2 photos. Nov. 1956.

Recent records reported here indicate that there is a remnant population of Canada lynx in n. Wis. The lynx is, however, nearly extinct in the state. The author presents reasons why the lynx should be given full protection and the bounty removed from it.

Leyhausen, Paul. VERHALTENSSTUDIEN AN KATZEN. Suppl. no. 2 to Z. Tierpsych. (Verlag Paul Parey, Berlin & Hamburg). 120 p., 76 figs. July 1956. DM 23,80, paper. [From review by R. H. Manville, J. Mamm. 38(1).]

"This monograph on cat behavior is based on observations and experiments on thirty caged and numerous free-ranging domestic cats, as well as on other species in many German zoos. The printing is of high quality, on good paper. The illustrations--many halftones and some line drawings--are clear and informative. Subject, species, and author indexes are provided, as well as a four-page Summary in English. Predation and social behavior are emphasized. The stalking methods of cats, the coup de grâce administered by a bite into the nape, and the plucking of feathers or fur before devouring, are described in detail. One learns that small mammals are always eaten head first; that cats seldom masticate their food; that domestic cats are specialized for capturing smaller animals than rats, and their ability to kill these rodents depends on their individual 'courage,' related in turn to social rank. Being solitary animals by nature, cats do not develop rigid social orders, although under crowded conditions one may assume temporary dominance. In the wild they do defend their fairly large hunting territories, at least in part, as well as their home areas, against intruding cats. Threatening and defensive behavior are described, as well as play, courtship, mating and parental care. Comparisons are drawn to the Viverridae, Mustelidae and some other primitive mammals. It is interesting to note that taxonomic differences between the Felinae and Pantherinae are reflected also in their feeding habits and mating behavior."

BIG GAME, GENERAL

Anon. THE MOOSE IN CONNECTICUT. Conn. Wildl. Cons. Bul. 2(6): 3, 1 photo. Nov.-Dec. 1956.

Proof of the occurrence of a moose at Warrenville in Sept. 1956 brought out apparently sound evidence that moose have been seen occasionally in Conn. for many years. Complete protection of law has now been given.

Brazda, A. R. (N. Dak. Game Dept.) SAGA OF THE BIGHORN. N. Dak. Outdoors 19(6): 4-9, 23 photos. Dec. 1956.

How 18 bighorns were trapped in B. C. in Nov. 1956 and released in a 200-acre enclosure in the badlands of N. Dak. Plans call for reestablishing this animal in various suitable sites in N. Dak.

Bubeník, A. B. A PECULIAR ANTLER DEVELOPMENT OF REINDEER. Z. Jagdwissenschaft 2(1): 21-24, 3 figs. 1956.

In German. Reindeer, in contrast to other deer, are able to begin further growth of their antlers after they have hardened, if the diet is improved.—V. F. Flyger.

Caesar, H. (Stromberg/Hunsrück.) INFLUENCE OF DENSITY ON WEIGHT DEVELOPMENT OF RED DEER. Z. Jagdwissenschaft 2(1): 13-20, 2 figs. 1956.

In German. The population of red deer in a forest increased because too few females were shot. The females are divided into four age classes, all of which showed decreased weight. Av. weight of all deer aged dropped from 47.5 Kg. to 41.8 Kg.--V. F. Flyger.

Denniston, Rollin H. (U. Wyo.) ECOLOGY, BEHAVIOR AND POPULATION DYNAMICS OF THE WYOMING OR ROCKY MOUNTAIN MOOSE, ALCES ALCES SHIRASI. Zoologica 41(3): 105-118, 2 figs. Nov. 1956.

Discusses in greater or lesser detail: relationship to wet areas, foods and feeding, locomotion, beds, adaptation to human influences, parasites, breeding and gestation, growth, diurnal activity cycles, annual activity cycle, development of behavior, aggressive behavior, social behavior, behavior in relation to

competing species, behavior toward man, present distribution of populations of the subspecies, numbers of individuals in the various populations. Moose are solitary in habit and this fact is reflected in many aspects of behavior. A. a. shirasi was almost extinct about 1900. Under protection by national parks and state game departments it has increased strongly, especially in recent years, and is doing well under controlled hunting. Total population of shirasi probably is over 8,000 and the range includes parts of 6 states and 2 provinces. Observations described in this paper were made chiefly in the region of Jackson Hole, Wyo.

Edwards, R. Yorke, and Ralph W. Ritcey. (B. C. For. Serv., Victoria.) THE MIGRATIONS OF A MOOSE HERD. J. Mamm. 37(4): 486-494, 2 graphs. Nov. 1956.

From 6-year study at Wells Gray Park, B. C. Summary: "Moose in the area studied undertake annual migrations between winter and summer ranges. Distance moved is 40 miles or more for some animals, while some may not migrate at all. Spring migration upward begins suddenly and movement is at first rapid, then slows. The start of this movement is associated with thaws and decreasing snow depths. Arrival of cold weather may slow the migration until warm weather returns. Movement downward appears to be more leisurely, and continues through the winter as snow depths increase. This slow drift downward may continue until spring migration begins. Winter range is a dynamic thing under these conditions, the centre of moose abundance moving downward slowly as snow accumulates throughout the winter."

Frankenberger, Zd. THE SEXUAL CYCLE OF THE RED DEER. Csl. Morfologie 1(1): 28-34. 1953. [From abstract by Bubenik in Z. Jagdwissenschaft 1(3).]

Czech with English summary. Histological study of testes of various aged C. elaphus at all seasons compared to roe buck (Capreolus). From the time of antler loss until the completion of antler growth, the testis and epididymis are in the resting state. When antler growth is complete, restoration of spermatogenesis begins and reaches peak in Sept.-Oct. followed by regression. Puberty is reached in second year of life but few sperm are produced. Peak of sexual activity is not reached until third or fourth year.--V. F. Flyger.

Frankenberger, Zd. THE ANTLER DEVELOPMENT OF RED DEER AND ITS RELATIONSHIP TO INTERNAL SECRETIONS. Vesmir 4(6): 199-201. 1955. [From German abstract by Bubenik in Z. Jagdwissenschaft 2(4).]

In Czech. A summary of present knowledge of hormonal regulation of cycle of antler growth in C. elaphus based on author's work and that of others, especially Wislocki. The hypophysis is the master gland for hormonal control of the antler cycle. The eosinophiles of the anterior lobe appear to promote antler growth. The basophiles produce gonadotropin and also cause the ossification of the antlers. The curves for eosinophile and basophile counts have 2 yearly maxima, for which the author presents a theory, although more work is necessary on this aspect. The thyroid also plays an active part in the cycle of antler development.--V. F. Flyger.

Freund, J. THE HYPOPHYSIS OF THE RED DEER AND ITS RELATIONSHIP WITH THE REPRODUCTIVE CYCLE. Csl. Morfologie 3(3): 212-221. 1955. [From German abstract by Bubenik in Z. Jagdwissenschaft 2(4).]

Czech with German summary. In the anterior pituitary of young C. elaphus the eosinophiles and chromatophile cells are predominant. The basophiles begin appearing at puberty. In the adult the basophiles increase greatly at the beginning of spermatogenesis and decrease after the rut. The number of eosinophiles increases as the basophiles decrease. The basophiles produce gonadotropin and the eosinophiles produce a growth hormone necessary for antler development. --V. F. Flyger.

Freundova, D. THE THYROID GLANDS OF RED DEER AND THEIR RELATIONSHIP TO THE SEXUAL CYCLE. Csl. Morfologie 3(3): 205-211. 1955. [From German abstract by A. Bubenik in Z. Jagdwissenschaft 2(3).]

Czech with German summary. Thyroid follicles are small in prepubertal animals and many parafollicular cells are found. Structure of the gland changes at the time of puberty. Average size of follicles increases and epithelial cells are high, indicating intensity of endocrine activity. During the sexually active time, follicles are large and filled with colloid; epithelial cells are low. At the beginning of spermatogenesis, follicles are small and epithelial cells low. Peak of activity occurs during rut.--V. F. Flyger.

Halloran, Arthur F. (Wichita Refuge, Cache, Okla.) WICHITA ANTELOPE ON COMEBACK TRAIL. Okla. Game & Fish News 12(12): 6-7, 1 photo. Dec. 1956.
Pronghorns were stocked time and again on the Wichita Refuge, Okla., but all introductions failed until 1938-40. The present herd has had its ups and downs and is still small, but appears to be on upgrade. Coyote control seems to have helped, but weather is also important. Wichita is at the e. edge of historic pronghorn range and it receives about 30 inches of rain instead of the 15-20 inches of some of our best pronghorn country.

Halloran, Arthur F. (Wichita Refuge, Cache, Okla.) LIVE AND DRESSED WEIGHTS OF AMERICAN BISON. J. Mamm. 38(1): 139. Feb. 1957.

Harry, G. Bryan. (Colo. State U.) WINTER FOOD HABITS OF MOOSE IN JACKSON HOLE, WYOMING. J. Wildl. Mgt. 21(1): 53-57, 1 map. Jan. 1957.
Willow comprised 3/4 of diet of moose during winter of 1953-54. Alpine fir made up 1/10 of the diet. Chokecherry, serviceberry, aspen, cottonwood, and lodgepole pine made up the remainder. Species of very high palatability included mountain ash (Sorbus scopulina), red osier dogwood (Cornus stolonifera), serviceberry, and bog birch (Betula glandulosa). Silverberry (Elaeagnus commutata), chokecherry, cottonwood, mountain maple (Acer glabrum), willow, aspen, and alpine fir were of high palatability. It is suggested that willow utilization be used as an indicator of moose over-abundance on Jackson Hole ranges. At present, moose wintering range along the Snake and Buffalo Fork rivers is overutilized.--Author.

Jackson, Hartley H. T. (6913 Ridgewood, Chevy Chase, Md.) THE RETURN OF THE VANISHING MUSK OXEN. Part I. Aud. Mag. 58(4): 262-265, 289, illus. Nov.-Dec. 1956. Part II. Aud. Mag. 59(1): 26-29, illus. Jan.-Feb. 1957.
Popular but factual account of history and natural history of the musk ox, the story of its Alaskan introduction in 1930, and results of the Fish and Wildlife Service's experimental studies there. Introduction of musk oxen on Nunivak Is. has been successful. The herd has increased; it numbered 76 in 1951. Exhaustive studies of possibilities of domestication of the musk ox "...clearly indicated that it is entirely impracticable to raise musk oxen as a farming or commercial enterprise..."--L. F. Stickel.

Jennings, William S. (Texas Game Comm.) THE TEXAS BIGHORN. Texas Game & Fish 14(12): 9, 25, 1 photo. Dec. 1956.
The estimated bighorn population of Texas was 150 in 1940. By 1945 the population was estimated at a little over 50: 35 in the Sierra Diablo range, a few others in that region, and about 15 in the Guadalupe range. Hunting has been forbidden since 1903. A refuge of 5,335 acres has been set up in the Sierra Diablo Mtns. but is too small to be highly effective. A pen of 1 sq. mi. has been built on the Black Gap Mgt. Area in Brewster Co. and will be stocked with bighorns from Ariz. Surplus animals from this enclosure will be used to restock suitable ranges.

Krott, P. REARING MOOSE CALVES. Z. Jagdwissenschaft 2(1): 1-13, 4 figs. 1956.
In German. Two calves raised by hand. Describes feeding, growth, eruption of teeth, antler development, and molt.--V. F. Flyger.

Mace, Robert U. OREGON'S ELK. Ore. State Game Comm. 33 p., illus. 1956.
Popular account of natural history, history in Ore., distribution and habitats in Ore., management, and hunting.

McCann, Lester J. (Coll. of St. Thomas, St. Paul, Minn.) ECOLOGY OF THE MOUNTAIN SHEEP. Am. Midl. Nat. 56(2): 297-324, 6 photos. Oct. 1956.
Study of bighorns in Gros Ventre region of nw. Wyo. Subjects discussed in greater or lesser detail include: classification; physical characteristics; evolutionary implications; origin; recent history in N. Am.; nature of study area; characteristics and uses of summer and winter ranges; wariness; mating habits; fighting; reactions to climatic conditions; feeding habits; fear of timbered areas and unbroken expanses; herd organization; herd movements; use of mineral licks; water relationships; predation by coyotes, pumas, golden

eagles, and other predators; accidents; parasites and diseases; competition with elk, cattle, and sheep; review of ecological needs of bighorns. Summary: "To summarize, therefore, the ecological niche of the mountain sheep consists of temperate to subarctic conditions which provide relatively continuous cliffy or broken topography. Forage (preferably grassy or herbaceous), water, and minerals must be available comparatively free of snow, and either among or immediately proximal to the required physiographic conditions."

Petersen, A. ENCOUNTERS WITH MUSK OXEN. Kosmos 52(1). Pages not stated. 1956. [From German abstract by Müller-Using in Z. Jagdwissenschaft 2(4).]
In German. After a very hard winter, the following summer's breeding season is omitted, making reproduction quite irregular. Introductions into Spitzbergen and an island off Alaska are the only successful cases. The animals are so dependent on living in the polar regions that even the climate of s. Greenland is too warm. Therefore, the animal is now seldom seen in the s. part of its range in Greenland. Hunting has also been a cause of this decline.--V. F. Flyger.

Sainio, Pekka. ON THE FEEDING OF THE MOOSE IN WINTER. Suomen Riista 10: 129-135, 5 figs. 1956.
In Finnish. English abstract on separate mimeo. sheet. From abstract: Now that aspen is scarce in Finland, willow accounts for approximately 70% of the moose's food in the whole country, 90% in the far north. Order of use of other tree species: aspen, pine, mountain ash, juniper, and birch. Moose eat mainly the last annual shoots of trees and bushes, and rarely gnaw bark. A moose consumes an av. of 340 twigs or terminal shoots per day in the winter; this corresponds to approximately 1.8 kg. of food.

Sainio, Pekka. MOOSE DAMAGE ON CULTIVATIONS. Suomen Riista 10: 142-145. 1956.
In Finnish. English abstract on separate mimeo. sheet. In Finland, moose do most damage to oats and some to rye, wheat, and hay. Damage payments, made by the state, totaled 4,732,431 marks in 1954, much less in 1955.

Snethlage, Karl. THE WILD BOAR (Das Schwarzwild). Verlag Paul Parey (Hamburg & Berlin). 200 p., illus. 1950. 8.40 DM. [From publisher's advertisement in Z. Jagdwissenschaft 2(3).]
In German. Contents of this book include stocking, preservation, habits, weapons, hunting, and handling of kill and trophies.--V. F. Flyger.

Taber, Richard D., Antoon de Vos, and Margaret Altmann. (MVZ, U. Calif., Berkeley.) TWO MARKING DEVICES FOR LARGE LAND MAMMALS. J. Wildl. Mgt. 20(4): 464-465, 2 figs. Oct. 1956.
Description of two automatic marking devices that can be set along trails.--Authors.

Tanner, Dale L. (Idaho Game Dept.) THE SOLDIER MOUNTAIN ELK HERD. Idaho Wildl. Rev. 9(3): 8-11, 5 figs. Nov.-Dec. 1956.
Elk were scarce in this part of s.-cent. Idaho in 1915, but with the aid of protection and stocking the herd increased enough to overuse its range by the early 1930s. Hunting began in 1941 and has continued to date, with number of permits rising from 100 to 800 and kill from about 50 to 306. The herd has increased despite the kill and now has some 1500 members. Winter range is in bad shape. Artificial feeding with hay and livestock cubes has been practiced at cost of $7.50 per head, Jan.-Mar. Elk do fairly well on this diet for short periods but must supplement it with natural browse. Browse is used excessively up to 2 miles from feeding stations and soil within this radius is disturbed. Important watershed values are thus reduced. Harmful effects of artificial feeding so far outweigh the few benefits that it is apparent that feeding is no answer to the problem. Improvement of forage conditions would be fine, but is not feasible with present knowledge. Herd reduction is the only advisable course.

Tener, J. S. (Can. Wildl. Serv., Ottawa.) GROSS COMPOSITION OF MUSK-OX MILK. Can. J. Zool. 34(6): 569-571. Dec. 1957.

Ueckermann, E. ON THE QUESTION OF VITAMINS AS A POSSIBLE CAUSE FOR BARK PEELING BY RED DEER AND FALLOW DEER. Der Anblick, Graz. 10. 1955. [From German abstract by Walter Rieck in Z. Jagdwissenschaft 2(1).]

In German. Studies on trees barked by deer showed no correlation with vitamin content (C, B_1, B_2 and nicotinic acid).--V. F. Flyger.

Ueckermann, Erhard. THE FALLOW DEER (Das Damwild). Verlag Paul Parey (Hamburg & Berlin). 114 p., 27 figs., 8 pls. 1956. 16.80 DM. [From publisher's advertisement in Z. Jagdwissenschaft 2(3).]

In German. According to the publisher this is a thorough coverage of biology and hunting of the fallow deer. Contains information on present and prehistoric distribution, numbers, development and growth, ecology, disease, food habits, prevention of forest damage by fallow deer, management, and bibliography.--V. F. Flyger.

Weswig, Paul H. (Agr. Exp. Sta., Ore. State Coll.) VITAMIN A STORAGE. Ore. State Game Comm. Bul. 11(12): 7. Dec. 1956.

In pronghorns of e. Ore. Pronghorn livers are 3-5 times as rich in vitamin A as are beef livers. Storage is greatest in summer and early fall. Apparently pronghorns of the region get plenty of carotene. Cause of failure of herd to increase will have to be sought elsewhere.

Wilson, D. R. (Ont. Dept. Lands & For., Lindsay District.) ONTARIO'S MOUNTAIN GOATS. Sylva 12(6): 13. Nov.-Dec. 1956.

Small colony of Himalayan thar has been more or less established in wild or semiwild state in the vicinity of mining operations in Methuen Township, Petersborough Co., Ont. The 4 thar appear active and healthy, are fed oats only in hardest part of winter, and have produced 1 young.

DEER (Odocoileus)

Anon. RHODE ISLAND'S WHITETAILS. Bul. Aud. Soc. R. I. 18(1): 1-2, 10, 1 fig. Feb.-Mar. 1957.

Precolonial R. I. was largely unforested owing to Indian activities, and probably had good deer populations. The colony imposed a closed season for deer in 1646. Agriculture extended over the hilltops and practically eliminated deer from 1700 to 1850. Since 1850 there has been much abandonment of hill farms and all stages of succession can be seen. Deer reappeared in some numbers about 1900 and were given complete protection until 1956. Still the herd is small, only about 750 animals. Two explanations are offered: 1. Repeated fires depleted soil and resulted in an impoverished vegetation. 2. Poaching was and is heavy. It became more or less accepted in the days when permits were issued freely to allow killing of crop-injuring deer. Permit procedure was tightened in 1950 but poaching continues on a relatively large scale; it is tolerated by the public and courts. This year an archery season for deer was initiated. The legal hunting will utilize a valuable resource and it should help build public opposition to poaching.

Banasiak, Chester F. (Maine Dept. Game.) FACTS BEHIND THE DEER SEASON RECOMMENDATIONS. Maine Dept. Inland Fisheries & Game. 1-14 p., 4 maps. Dec. 1956.

423 deer yards throughout Maine were rated as to degree of use. Overused yards were mostly in a huge part of the state that is mainly forest. Data tabulated here show that deer from this region have lower rate of reproduction, poorer antlers, and smaller size. Kill also is lower in this region. Solutions to the problem are improvement of yards, which is not yet feasible, and increased kill in problem region. To facilitate the latter, new system of zoning and seasons has been worked out and is described in this paper.

Bartlett, I. H. (Mich. Dept. Cons.) DEER, 1956. Mich. Cons. 25(6): 2-7, 3 photos. Nov.-Dec. 1956.

A brief but quantitative analysis of populations, reproduction, range conditions, and huntable surpluses in the 3 major regions of Mich. "And to summarize: Most of our 35,000 square miles of major deer range is saturated with deer. Any increase in the wintering herd will further damage the range

and result in waste through starvation. Our spring herd of 500,000 deer is expected to produce possibly 300,000 fawns, half of which are expected to survive to the deer season, creating a surplus of 150,000 deer. Some 80,000 of these are expected to be removed by legal hunting (bucks plus special seasons) and another 45,000 will be needed to replace miscellaneous losses--dog kills, disease, etc. This leaves 35,000 surplus deer which, if the winter is normal or severe, will be eliminated by nature (starvation) and wasted before spring."

Bartlett, I. H. (Mich. Dept. Cons.) QUOTAS AND AREAS. Mich. Cons. 25(6): 22-30, illus. Nov.-Dec. 1956.

State game officials and others concerned with regulatory problems may be interested in this rather detailed account of the facts and reasoning used in Mich. to determine how many deer should be taken in special areas in special seasons and how many permits should be issued for each area to achieve the desired kill.

Bersing, Otis S. (Wis. Cons. Dept.) A CENTURY OF WISCONSIN DEER. Wis. Cons. Dept. viii + 184 p., maps. 1956.

Prefacing the book is a 20 p. digest of the history of deer and deer problems in Wis. from earliest times. The balance is devoted to tables of deer statistics, many of them accompanied by explanatory notes or comments, and maps. In all it comprises a detailed documentation of status and kill of deer in Wis. Separate sections tabulate data on deer hunting by gun and by bow. The appendix provides statistical data on many other subjects such as hunting accidents, license sales, illegal kill, weights, record antler formations, and feeding and damage costs.--L. F. Stickel.

Bischoff, Arthur I. (Calif. Dept. Game.) THE BREEDING SEASON OF SOME CALIFORNIA DEER HERDS. Calif. Fish & Game 43(1): 91-96, map & graph. Jan. 1957.

Summary: "A total of 427 does was collected and their embryos aged to determine breeding dates. These represented animals from 12 herds, of which six were black-tailed deer herds and six were mule deer herds. Breeding periods varied from herd to herd and with their geographic locations. Among the black-tailed deer herds studied, breeding occurred from late October to early January. The more southerly herds had the earliest breeding dates. Mule deer herds had breeding periods extending from the third week of September to the last week in January, with the more northerly herds having the earliest breeding dates. An exception to this was the Camp Pendleton deer herd, in which breeding started earlier and extended over a longer period than in any other group."

Blaisdell, James A., and Richard L. Hubbard. (Calif. Dept. Game.) AN OUTRIGGER TYPE DEER FENCE. Calif. Fish & Game 43(1): 100-102, 1 fig. Jan. 1957.

Same arrangement described by authors in For. Res. Notes no. 108 of Calif. For. & Range Exp. Sta. (see WR 87: 46).

Bromley, A. W., and C. W. Severinghaus. (N. Y. Cons. Dept.) LIVE-TRAPPING WHITE-TAIL DEER. N. Y. State Cons. 11(2): 4-5, 2 figs. Oct.-Nov. 1956.

Hunting was out of the question on the Seneca Ordnance Depot so live trapping was resorted to by the army. Trapping was successful and 318 deer were caught and transferred in 2 years. Reproduction and influx were much greater, however, and no solution short of actual starvation is in sight. Cost was $28.93 per deer. Had the state game department undertaken the job, it would have wound up with a huge bill as well as a failure in herd control. "These are handy facts to have on tap the next time someone asks: 'Why not live-trap the deer and move them out?'"

Browman, Ludvig G., and Howard S. Sears. (Mont. State U.) CYCLIC VARIATION IN THE MULE DEER THYMUS. Proc. Soc. Exp. Biol. & Med. 93(1): 161-162, 1 graph. Oct. 1956.

Summary: "Thymus glands from a series of fawn, yearling, and adult female mule deer, collected on the National Bison Range, Moiese, Mont., varied in volume with the season. The thymus reached its lowest volume during the winter months (Dec.-Feb.) and reached its largest size in all 3 age classes during late spring and early summer (May-July). All 3 groups exhibited the same type of annual thymus volume cycle, although the fawns had the highest value of the 3 age classes for the late spring-early summer months. Pregnant or lactating

adult does had the lowest value of the 3 age classes for that time of year, although these values were considerably higher than those of the winter months. The data permit the hypothesis that light stimulates production of a thymotropic hormone probably via the pituitary gland. There is very good correlation between average monthly hours of daylight and thymus volume/body weight curves. Stress factors such as high temperatures and 'burnt up' vegetation in late summer, and cold temperatures and difficultly available food in snowy winter months may also affect the size of the thymus."

Chute, H. L., and D. M. Chamberlain. (U. Maine.) LYMPHANGIOMA IN THE WHITE-TAILED DEER, ODOCOILEUS VIRGINIANUS. J. Mamm. 37(4): 552-554, 2 photos. Nov. 1956.

Report of 1 case (age, locality, etc. not stated) with notes on pathology and review of literature.

Gilbert, Paul F., and Jack R. Grieb. (Colo. Game Dept.) COMPARISON OF AIR AND GROUND DEER COUNTS IN COLORADO. J. Wildl. Mgt. 21(1): 33-37, 1 fig. Jan. 1957.

Aerial counts of deer made under similar counting conditions tallied between 34.2% and 49.0% when experienced counters were used. Snow background is the biggest factor affecting percentage of deer observed. It is possible to make accurate estimates of total numbers of animals present after an air-to-ground ratio has been determined for a given habitat type and snow cover.--P. F. Gilbert.

Golley, Frank B. (Mich. State U.) AN APPRAISAL OF OVARIAN ANALYSES IN DETERMINING REPRODUCTIVE PERFORMANCE OF BLACK-TAILED DEER. J. Wildl. Mgt. 21 (1): 62-65, 2 figs. Jan. 1957.

Information was obtained on limitations of determining reproductive performance of black-tailed deer from analyses of ovaries collected during anestrous. 151 pairs of ovaries were sectioned sagittally and examined grossly; 43 pairs were examined histologically. Examination of adult ovaries indicated that all pigment spots do not represent corpora albicantia of corpora lutea of pregnancy. Incidence of ovulation determined by analyses of pigment spots was about 18% higher than that derived from count of corpora lutea of pregnancy in gestation-period ovaries. Histological examination revealed few differences in cell structure of corpora albicantia of varying sizes and ages. Possible sources of pigmented corpora albicantia, other than corpora albicantia of corpora lutea of pregnancy, are discussed.--Author.

Golley, Frank B. (Mich. State U.) GESTATION PERIOD, BREEDING AND FAWNING BEHAVIOR OF COLUMBIAN BLACK-TAILED DEER. J. Mamm. 38(1): 116-120. Feb. 1957.

From author's summary: "The gestation period and breeding and fawning behavior of black-tailed deer were determined by observation of semi-wild deer penned only during the breeding and fawning periods. The gestation period as determined by this experiment ranged from 199 to 207 days with an average of 203 days." Breeding behavior is described.

Grelen, Harold E., and Gerald W. Thomas. (US For. Serv., Marianna, Fla.) LIVESTOCK AND DEER ACTIVITIES ON THE EDWARDS PLATEAU OF TEXAS. J. Range Mgt. 10(1): 34-37, 4 figs. Jan. 1957.

Grazing habits and daily activities of cattle, sheep, goats, and deer are described on basis of observations made in summer of 1955 at Kerr Wildl. Mgt. Area, Hunt, Texas. These observations were made in deer-proof pastures, each of which was 96 acres in size and held 10 deer and various combinations of livestock. "Deer activities appeared irregular in the experimental pastures. Greatest activity was noted in the evening when most deer watered. Grazing began very early in the morning and most of the day was spent resting, although some mid-day grazing was observed. More time was spent grazing, usually in the open areas, than was spent searching for woody browse."

Grisez, Ted. (NE. For. Exp. Sta., Upper Darby, Pa.) DEER-BROWSING IN THE POCONOS. Pa. Game News 28(2): 7-10, 3 photos. Feb. 1957.

Deer and rabbit exclosure studies were begun in Pocono Exp. For., Pa., in 1952. Evaluation in 1955 showed striking and significantly greater numbers of valuable forest tree species in deer exclosures. Low-value beech and striped

maple were more numerous on unprotected plots. Five species of shrubs and 3 non-commercial tree species considered valuable to wildlife for food or cover were much more numerous in exclosures. There were no consistent differences in plant growth between deer exclosure plots and plots from which both deer and rabbits were excluded.--L. F. Stickel.

Halls, L. K., F. E. Knox, and V. A. Lazar. COMMON BROWSE PLANTS OF THE GEORGIA COASTAL PLAIN / THEIR CHEMICAL COMPOSITION AND CONTRIBUTION TO CATTLE DIET. US For. Serv., SE. For. Exp. Sta. (Asheville, N. C.), Sta. Pap. no. 75. 1-18 p., 7 photos. Jan. 1957.

[Handley, Rolland B.] A NEW TECHNIQUE FOR CAPTURING DEER. Miss. Game & Fish 20(7): 4, 2 photos. Feb. 1957.
On the latest method used in Ga. by Crockford. Deer are spot-lighted at night and shot in the hip muscle with a dart carrying nicotine salicylate. The drug takes effect within 4 min. A sedative drug is given to prolong anesthesia for about 25 min. to give time for tagging and loading. The deer is given a shot of penicillin to prevent infection, the wound is sprayed with anti-screw worm medicine, and the entire animal is sprayed for removal of ticks. --L. F. Stickel.

Karstad, Lars, and R. P. Hanson. (U. Wis.) VESICULAR STOMATITIS IN DEER. Am. J. Vet. Res. 18(66): 162-166, 3 photos. Jan. 1957.
Summary: "1) Vesicular stomatitis in swine was recognized as an enzootic disease in southeastern United States in 1952. 2) Detection of neutralizing antibodies in deer from southern Georgia and reports of disease by hunters led to the consideration of deer as a possible reservoir of vesicular stomatitis. 3) Five deer were inoculated by several routes with vesicular stomatitis virus and developed mild, acute, or abortive infections. 4) Deer are probably not important reservoirs of the virus, since recovery is rapid. They may have a minor role in maintaining the summer epizootic. The disease in deer, although mild under experimental conditions, may be more serious under certain stress conditions existing in the field."

Keener, John M. (Wis. Cons. Dept.) A NEW DEAL FOR DEER AND HUNTER. Wis. Cons. Bul. 21(12): 3-9, 3 maps. Dec. 1956.
A committee of the Wis. Cons. Dept. and U. S. For. Serv. analyzed the Wis. deer problem and came up with a number of recommendations. The basic one was that deer kill should be manipulated by units, as long done in various western states. These units, mapped here, would be outlined by highways. There would be a statewide buck season as before and then a bonus season in the units, most of which would be northern. Apparently no new legislation would be needed. More funds, however, would be needed for quantitative local surveys necessitated by the plan. Timber harvest schedules would be coordinated with the hunting plan to improve local deer-habitat conditions insofar as density of herd justified and permitted. The present paper does not say whether either-sex harvesting would be used in the new plan.

Keener, John M. (Wis. Cons. Dept.) THE 1956 DEER SEASON. Wis. Cons. Bul. 22(2): 8-11, map. Feb. 1957.
Total deer kill in Wis. increased only slightly over 1955. There was a 17% increase in bucks, made up almost entirely of spike bucks, legal in 1956 but not in 1955. Total kill decreased in the area where an any-deer season was allowed in 1955 but not in 1956. The season did little to balance deer numbers with range conditions in areas of poor deer range. The problem of getting deer harvested in areas where the need is greatest is becoming increasingly difficult, for most hunters wish to travel only a short distance.--L. F. Stickel.

Kitts, W. D., P. J. Bandy, A. J. Wood, and I. McT. Cowan. (U. of B. C.) EFFECT OF AGE AND PLANE OF NUTRITION ON THE BLOOD CHEMISTRY OF THE COLUMBIAN BLACK-TAILED DEER (ODOCOILEUS HEMIONUS COLUMBIANUS). Can. J. Zool. 34(5): 477-484, 1 fig. Oct. 1956.
Abstract: "A study has been made of the normal chemistry of the blood constituents...in relation to growth and the caloric plane of nutrition. The results showed a significant difference of packed-cell volume and hemoglobin

level between the two age groups of experimental animals, while no significant differences were found in the sedimentation rates. The high and low imposed planes of nutrition did not bring about a significant difference in packed-cell volume, sedimentation rate, or hemoglobin value."

Krefting, L. W., H. L. Hansen, and M. H. Stenlund. (2933 McKinley St. NE., Minneapolis 18, Minn.) STIMULATING REGROWTH OF MOUNTAIN MAPLE FOR DEER BROWSE BY HERBICIDES, CUTTING, AND FIRE. J. Wildl. Mgt. 20(4): 434-441, 7 figs. Oct. 1956.

Herbicides, burners, diesel oil, and axes were used to topkill Acer spicatum in ne. Minn. Tests were made both spring and fall. Treatments were applied both at bases of clumps and breast-high. Butoxy ethanol esters of 2,4,-D and 2,4,5,-T were used at acid equivalents of 4, 8, 12, and 16 lbs. per 100 gals. of oil. 170 clumps were treated. Cutting with axe gave best sprout growth and had additional advantage of providing edible tops. Spraying at breast height was next best in causing sprouting. Sprouting was greatest with the highest chemical concentrations. Deer showed some preference for herbicide-treated clumps. Fire did not stimulate an appreciable regrowth. Oil alone had less effect than cutting or herbicides. Cutting cost about $5.00 per acre, which was about equal to final cost of spraying with herbicides.

Leach, Howard R. (Calif. Dept. Game.) FOOD HABITS OF THE GREAT BASIN DEER HERDS OF CALIFORNIA. Calif. Fish & Game 42(4): 243-308, 36 figs. Oct. 1956.

A long, detailed report based on analyses of 978 mule deer stomachs collected from 4 winter ranges: Devils Garden, Lassen Washoe, Verdi, and Inyo. Some information is given on food habits in summer, but most of the paper deals with winter foods. Each area and its vegetation is described and its seasonal use by deer is reviewed. Food habits in the area are then tabulated, graphed, and discussed thoroughly in relation to year-to-year climatic variations and deer die-offs. The bulk of the winter food consists of sagebrush, bitterbrush, juniper, and annual grasses. Utilization of most species varies widely with local and seasonal conditions, but the most variable item is grass. Grass is eaten all winter, and in 1 mild winter it constituted half the food of the Devils Garden herd. An open winter is characterized by heavier use of grass and a diversified browse diet. Winter mortality is usually negligible in such winters. Severe winters force deer to rely on browse species that they otherwise would not eat so heavily. Preference becomes secondary to survival. Deer that perish in die-offs almost always have their stomachs full of the same foods found in survivors. Apparently the deer that survive do so not because of better diet but because they have greater vigor and better condition.

Low, Jessop B. (Utah State Agr. Coll.) CONTROL DEER DAMAGES. Farm & Home Sci. (Agr. Exp. Sta., Logan, Utah) 16(4): 78-82, 4 photos. Dec. 1955.

Review of methods of prevention. Chemical repellents (several are described) are often effective against summer damage when other food is available, but not against starving deer in winter. Other methods discussed include frightening devices, fencing, wrapping trees, supplemental feeding, herding, and controlled shooting of deer. Pruning following deer damage is recommended to aid damaged trees and shrubs to outgrow the damage. Where small farms or other lands are extensively damaged, and are in the heart of deer range, the Fish & Game Department has sometimes been able to purchase such properties.--L. F. Stickel.

Progulske, Donald Robert. MOVEMENTS AND HOME RANGES OF THE WHITE-TAILED DEER (ODOCOILEUS VIRGINIANUS) IN CENTRAL MISSOURI. Ph.D. thesis, U. Mo. 86 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]

Movements of deer on a 2240-acre wildlife refuge were determined by observations of marked animals, and by tracking. A new type of collar with colored plastic designs attached to leather was developed. Home-range diameters averaged 1680 yds. for does and fawns and 2800 yds. for bucks. Minimum ranges av. 210 acres for does and fawns and 420 acres for bucks. During spring, summer and part of the fall, some deer seemed to have small and distinct home ranges from which they apparently departed in winter. Records of chases of deer by hounds were kept for 20 consecutive months. Peak was in Dec. (raccoon hunting season), with a secondary peak in May (fox hunting time). "The greatest average number of chases occurred on Saturdays, showing that many of the hounds were not strictly free-running but were taken on hunts by their owners. Very few hounds caught were collarless, indicating that most were not strays."--L. F. Stickel.

Robinette, W. L., J. S. Gashwiler, J. B. Low, and D. A. Jones. (US F&WS, Salt Lake City, Utah.) DIFFERENTIAL MORTALITY BY SEX AND AGE AMONG MULE DEER. J. Wildl. Mgt. 21(1): 1-16. Jan. 1957.

Sex-ratio records for 2,299 fetuses, 808 newly born fawns, 13,046 hunter-killed fawns, and 8,938 fawns and about 2,000 older deer dying during winter are presented for mule and black-tailed deer. These records clearly indicate a pre- and early postnatal surplus of males--with a ratio of 114 males per 100 females for fetuses and newly born fawns and the same ratio for hunter-killed fawns. The sex ratio of fawns dying during winter contained a much lower proportion of males (97:100), giving rise to the belief that over-winter mortality rate for female fawns exceeds that of males. There was some indication, however, that males might suffer heavier losses than females during the pre- and early post-natal periods. There was also some inconclusive evidence that a low nutritional plane, an increase in litter size, prior fawn production by the doe, and pre-natal mortality could be factors in lowering the proportion of males at birth. Winter mortality rate for male yearlings appears to be about double that of females, but results for older deer were found to be quite variable. Winter mortality rate of fawns was about 2.6 times that of older deer and about 2.3 times that of yearlings, whereas the yearling loss rate was about 1.6 times that of older deer.--W. L. Robinette.

Schultz, Arnold F. (Cons. Comm. W. Va.) RESULTS OF THE 1956 DEER KILL [Cover title: The 1956 Deer Season]. Cons. Comm. W. Va. i + 14 p., 2 maps. [1957?]

18,000 deer were harvested in W. Va.'s 6th season under a management plan permitting doe harvest in certain areas. The plan is considered highly successful. It is outlined in detail with maps and tables showing management classification of each county and the kill-bases used to decide on harvesting regulations. Tables show total kills 1951-56, the 1956 harvest by day of season, and 1956 sex ratios.--L. F. Stickel.

Shope, Richard E., and Robert Mangold. (Ridge Rd., Kingston, N. J.) OBSERVATIONS ON TWO DEER DISEASES: EPIZOOTIC HEMORRHAGIC DISEASE AND FIBROMA. Proc. NE. Sec. Wildl. Soc. et al. 1-5 p., mimeo. Jan. 1957.

Symptoms and pathology of both diseases are described. Both are virus diseases and both seem to affect only deer. Fibroma causes multiple skin tumors that are relatively harmless and may regress. It has been transmitted artificially from deer to deer. Hemorrhagic disease, now considered the same as black tongue disease of deer, is often fatal and has caused heavy mortalities. It is known from N. J., Mich., N. Dak., and the Southeast. It did not appear in N. J. in 1956. Artificial transmission from deer to deer has been successful but attempts to transmit by insects have failed. Deer that recover have resistance to the disease.

Smith, Arthur D. (Utah State Agr. Coll.) RENOVATING OVERUSED DEER WINTER RANGE. Utah Fish & Game Bul. 13(1): 6-7, 6 photos. Jan. 1957.

Shrubby plants of deer winter range in Utah often become highlined and are thereafter unproductive for deer. Three species are of special importance in this connection: curlleaf mahogany, Utah juniper, and Rocky Mtn. juniper. The author removed 75% or 100% of the unbrowsed tops from sample trees of these species. This was done in spring; results were determined before deer use in fall. The treatment caused marked increases in forage production, as shown by tabular data. Long-term results, under deer browsing and drought, apparently are less favorable, as some of the plants died within 3 years.

Smith, Frank H., Kenneth C. Beeson and Walter E. Price. (N. C. Agr. Exp. Sta., Raleigh.) CHEMICAL COMPOSITION OF HERBAGE BROWSED BY DEER IN TWO WILDLIFE MANAGEMENT AREAS. J. Wildl. Mgt. 20(4): 359-367. Oct. 1956.

The browse growing in two wildlife management areas of N. C. was analyzed for calcium, phosphorus, manganese, cobalt and the constituents detd. by proximate analysis. One area located in the Coastal Plain supported few and unthrifty deer. The other, located in the mountains of N. C., supported deer of normal size and herd composition. The browse in the Coastal Plain was deficient in protein, phosphorus and cobalt. Crude fat and nitrogen-free extract were high; the crude fiber was relatively low. Crude protein and phosphorus were highest in spring and declined markedly by summer; then protein declined gradually to a low in winter while phosphorus remained rather constant.

Calcium was lowest in spring and highest in fall and winter, but probably was adequate at all seasons. Manganese, iron, and copper, though variable with season, were probably adequate at all times. Cobalt was low and relatively constant. The poor performance of deer in the Holly Shelter Area was attributed in part to inadequate protein, phosphorus and cobalt. The herbage in the mountain area varied in composition in a manner similar to that in the Coastal Plain but probably was adequate for deer. The calcium content of the herbage in the mountain area was extremely high. Suggestions for improving diets of deer in the Coastal Plain were offered.--F. H. Smith.

Stoeckeler, J. H., R. O. Strothmann, and L. W. Krefting. (Lake States For. Exp. Sta., St. Paul, Minn.) EFFECT OF DEER BROWSING ON REPRODUCTION IN THE NORTHERN HARDWOOD-HEMLOCK TYPE IN NORTHEASTERN WISCONSIN. J. Wildl. Mgt. 21(1): 75-80, 2 figs. Jan. 1957.

Results of counts of natural reproduction in deer exclosures in northern hardwood-hemlock stands in ne. Wis. indicate that after 5 to 8 years of protection against white-tailed deer there was abundant reproduction which had reached a height of 4.6 feet or larger inside the exclosures (av. 6,002 per acre) while unfenced controls had fewer seedlings of that height (1,021). Av. height of all seedlings present in exclosures was often double that of unprotected seedlings. Populations of 35 to 54 deer per sq. mi. resulted in severe and repeated browsing and malformation of stems of reproductions, and were a serious hindrance to sustained-yield forest management. Recovery of deer-browsed seedlings occurred only after a 6 to 8-year period of protection.--J. H. Stoeckeler.

Webb, Wm. L. (State U. of N. Y., Syracuse.) INTERPRETATION OF OVERBROWSING IN NORTHEASTERN FORESTS. J. Wildl. Mgt. 21(1): 101-103. Jan. 1957.

A review of some recent studies on effects of white-tailed deer on forest vegetation by exclusion of animals and by simulated browsing. Browsing animals often do damage forest vegetation, but not all heavy browsing can be interpreted as overbrowsing. In many forest types, and at some stages of forest rotation, heavy browsing is allowable and perhaps even desirable. Evaluation of effects of browsing on forest vegetation must depend on forest type, age of stand, species composition, stand density, and in some cases on the relative economic values of deer and timber.--Author.

Westell, Casey E., Jr. (Am. Box Board Co., Filer City, Mich.) DEER, CLUB COUNTRY, AND INDUSTRY. Mich. Cons. 25(6): 12-15, 3 photos. Nov.-Dec. 1956.

Hunting clubs own much aspen and other forest land in Mich. Tree growth has gradually reduced value of the land for deer. Now clubs are entering into contracts with pulp companies. Company technicians plan and supervise cutting programs, employ local labor, and buy the pulpwood. Deer benefit greatly from the masses of cut tops and from the heavy sprouting. The change also aids grouse and snowshoe hares. Companies and local communities gain financially. The movement is said to be growing rapidly.

MAMMALS--MARINE

Chittleborough, R. G. PUBERTY, PHYSICAL MATURITY, AND RELATIVE GROWTH OF THE FEMALE HUMPBACK WHALE, MEGAPTERA NODOSA (BONNATERRE), ON THE WESTERN AUSTRALIAN COAST. Australian J. Marine & Freshwater Res. (Melbourne) 6(3): 315-327. Oct. 1955. [From J. Mamm. 37(3).]

Davies, J. L. (U. Tasmania, Hobart.) THE GREY SEAL AT THE ISLES OF SCILLY. Proc. Zool. Soc. London 127(2): 161-166, 1 map. Oct. 1956.

Summary: "The Cornish Grey Seal [Halichoerus grypus] colonies have remained static in contrast to a general increase in numbers elsewhere in Britain. At Scilly, almost continuous human interference is thought to have been either directly or indirectly responsible for this. The seals breed on exposed rocky islets in the west of the archipelago and the total population is thought to be about fifty. Short notes are given on breeding behavior and a short term marking technique for seal calves is explained. A comment is made on the general nature of seasonal movements in the species."

MAMMALS--MARINE--Continued

Eibl-Eibesfeldt, Irenäus. ETHOLOGISCHE STUDIEN AM GALÁPAGOS-SEELÖWEN, ZALOPHUS WOLLEBAEKI SIVERTSEN. Z. Tierpsych. (Berlin) 12(2): 186-303, illus. Nov. 1955. [From J. Mamm. 37(3).]

Laws, R. M. THE ELEPHANT SEAL (MIROUNGA LEONINA LINN.). II. GENERAL, SOCIAL AND REPRODUCTIVE BEHAVIOR. Sci. Reps. Falkland Is. Dependencies Surv. (London), no. 13. 88 p., illus. 1956. [From J. Mamm. 38(1).]

Moore, Joseph Curtis. (Am. Mus. Nat. Hist., N. Y.) OBSERVATIONS OF MANATEES IN AGGREGATIONS. Am. Mus. Novitates no. 1811. 1-24 p., 5 figs. Dec. 1956.
Numbers at Miami, Fla. (about 195), effect of cold snaps in causing aggregation behaviour, residence and movements of manatees at Miami, play, greeting, courtship, reproduction, behavior of young, and locomotion.

Neill, Wilfred T. (Ross Allen's Reptile Inst., Silver Springs, Fla.) THE VANISHED SEA WOLVES. Fla. Wildl. 10(9): 16-17, 38, 2 figs. Feb. 1957.
Factual account of the near-extermination of West Indian monk seal. Once abundant, this seal was slaughtered wholesale even after it had become rare, and now exists in but 1 or 2 places. It is hoped that some of the very few survivors can be introduced into protected waters.

MAMMALS--OTHER GROUPS

Crites, John Lee. STUDIES ON THE MORPHOLOGY, TAXONOMY, AND LIFE HISTORY OF CRUZIA AMERICANA MAPLESTONE, 1930, A PARASITIC NEMATODE OF DIDELPHIS MARSUPIALIS VIRGINIANA. Ph.D. thesis, Ohio State U. 1956. [From abstract in Dissertation Abstracts 16(12).]

BIRDS--GENERAL

Arbib, Robert S., Jr. (231 W. Lena Ave., Freeport, N. Y.) THE NEW YORK STATE STANDARDS OF ABUNDANCE, FREQUENCY, AND SEASONAL OCCURRENCE. Aud. Field Notes 11(1): 63-64. Feb. 1957.
What, actually, is meant by such terms as "common," "occasional," and "rare?" Obviously, meanings vary between users and between animals of different sizes and kinds. The N. Y. State Bird Book Committee has come to grip with the problem and now proposes definitions. These definitions are as quantitative as it is feasible to make them and still have them suitable for general use. An abundance scale is presented for nonbreeding birds. Another scale is presented for breeding birds; here size of bird is considered. Other scales are suggested for frequency and for seasonal occurrence. These scales will be used in N. Y. bird publications and they are believed to be suitable for use elsewhere.

Cottam, Clarence. (Welder Wildl. Found., Sinton, Texas.) USES OF MARKING ANIMALS IN ECOLOGICAL STUDIES: MARKING BIRDS FOR SCIENTIFIC PURPOSES. Ecol. 37(4): 675-681. Oct. 1956.
Review of methods used in marking birds and some of the results.

Emlen, John T., Jr. (U. Wis.) A METHOD FOR DESCRIBING AND COMPARING AVIAN HABITATS. Ibis 98(4): 565-576, 2 figs., 1 pl. Oct. 1956.
Summary: "Detailed studies of ecological distribution and habitat specificity require objective, quantitative data which are rarely available in the reference system customarily used for designating habitat relations. A scheme of habitat description was developed and tested in a variety of situations in Africa and North America based on the selection of a set of measurable features or dimensions, each of which was graduated for quantitative or qualitative evaluation. A procedure for recording measurements in the field is described. Examples are presented showing how quantitative habitat data may be applied in erecting vegetation formulae of various degrees of refinement, in making semi-pictorial habitat diagrams, and analyzing subtle differences in habitat selection by different species or populations."

BIRDS--GENERAL--Continued

Hutson, H. P. W., editor. THE ORNITHOLOGIST'S GUIDE. Philosophical Library, N. Y. xix + 275 p., 34 figs. 1956. $6.00. [From review by F. J. Pierce, Iowa Bird Life 27(1).]

Prepared by 46 experts, mostly British, this book is designed as a guide to study of birds in many parts of the world. "It is divided into these nine sections: 'General,' covering field recognition, collecting, classification, plumage, life-history studies; 'Geographical Aspects,' mostly on habitat, range, and migration; 'General behavior;' 'Breeding,' touching seasons, nesting sites, courtship displays and parental cares; 'Protection,' with a review of conservation and game management; 'Study Techniques,' covering 20 smaller classifications such as field glasses, photography and tape-recording, trapping, banding, making censuses and breeding surveys, making skins, and observing birds at night; 'Suggestions for Special Study;' 'Regional Information,' a chapter giving lists of reference books for various regions of the world, important bird collections, and societies and individuals who would be useful for contacts and providing further information (most of the world is covered, including the West Indies and Latin America, but U.S.A. is omitted); 'General Information,' a final chapter giving addresses of the 'bird-ringing' societies of the world, a listing of bird reserves in the United Kingdom, and the various British bird societies and their serial publications." Pierce considers the book well prepared, quite complete for its length, and "a fine guidebook for the isolated bird student who is searching for ways to supplement his field studies."

Palmer, Ralph S. (N. Y. State Mus., Albany 1.) EGG PROFILES. Am. Ornith. Handbook Fund (N. Y. State Mus.). 1 p., illus. Oct. 1956.

Proposed standard for describing shapes of avian eggs. The four major categories are elliptical, subelliptical, oval, and pyriform. Each is subdivided into 3 groups from long to short, making a total of 12. Outline drawings convey the system quickly. The system is to be used in handbook of N. Am. birds.

Palmer, Ralph S., and E. M. Reilly, Jr. (N. Y. State Mus., Albany 1.) A CONCISE COLOR STANDARD. Am. Ornith. Union Handbook Fund (N. Y. State Mus.) 1-8 p. + color chart. Oct. 1956.

Simplified approach to biological color description. Designed for use in handbook of N. Am. birds. Starting with the Villalobos color system, which is considered the best, and with a list of color terms actually used commonly for avian colors, the authors devised a chart of 48 color samples. 20 of these are saturated spectral hues--yellows through greens, blues, and reds. 21 are arbitrarily selected as the most-needed brownish colors (cream, tawny, sepia, etc.). 7 represent the gray scale from white to black. The proposed system consists of describing colors in terms of these samples with a set of standardized modifying terms such as pale, deep, bronzy, silvery, burnished, dull, etc. Names are given for all samples. Ridgway equivalents, so far as they exist, are also given for samples. Text describes system and discusses color-description problems.

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION

Bartholomew, George A., and Tom J. Cade. (U. Calif., Los Angeles.) WATER CONSUMPTION OF HOUSE FINCHES. Condor 58(6): 406-412, 4 graphs. Nov.-Dec. 1956.

Experimental study. "The relative water consumption of those [species of] wild birds which have been studied decreases directly with increasing body size and shows a curve similar to that of respiratory water loss relative to weight. It is suggested that most desert birds have not evolved special mechanisms of water conservation and that the smaller the bird the more acute is its need for surface water, or failing that, a succulent diet."

Busnel, R.-G., J. Giban, Ph. Gramet, and F. Pasquinelly. (Inst. Natl. Recherche Agr., Versailles, France.) ABSENCE D'ACTION DES ONDES DU RADAR SUR LA DIRECTION DE VOL DE CERTAINS OISEAUX. Comptes Rendus des Séances de la Société de Biologie 150(1): 18 (3 p. in reprint). Jan. 1956.

Experiments on various species of birds gave no indication that radar affects flight. Hypothesis is offered for contrary observations of Knorr (Wilson Bul. 66: 264) and Drost (Nos Oiseaux 23: 128).

BIRDS--MORPHOLOGY, PHYSIOLOGY, BEHAVIOR, MIGRATION--Continued

Goldsmith, Timothy H., and Donald R. Griffin. (Harvard U.) FURTHER OBSERVATIONS OF HOMING TERNS. Biol. Bul. 111(2): 235-239, map & graph. Oct. 1956.
Common terns from New Eng. coast and Great Lakes region were released at Cortland, N. Y. on same day. Both groups tended to head approximately southeast, apparently with little regard to topography. Orientation by topography is known to occur in birds, but the present experiments, as well as work of Kramer, Matthews, et al., suggest that more refined methods of navigation may also be used.

King, James R., and Donald S. Farner. (State Coll. Wash.) BIOENERGETIC BASIS OF LIGHT-INDUCED FAT DEPOSITION IN THE WHITE-CROWNED SPARROW. Proc. Soc. Exp. Biol. & Med. 93(2): 354-359, 2 graphs. Nov. 1956.
Experiments indicate that premigratory deposition of fat is caused by exceptionally heavy eating, which is triggered by increase in length of day.

Kramer, Gustav. (Max-Planck-Inst. für Meeresbiologie, Wilhelmshaven, Germany.) EXPERIMENTS ON BIRD ORIENTATION AND THEIR INTERPRETATION. Ibis 99 (2): 196-227, 10 figs. Apr. 1957.
Largely an unfavorable review of Matthews' sun-arc hypothesis. Many new and old data on orientation are discussed. Blanks in knowledge are pin-pointed and some possible lines of attack are suggested. Among other interesting facts brought out, it now appears that birds can orient at night by position of stars.

Lockie, J. D. (Nature Conservancy, Edinburgh, Scotland.) WINTER FIGHTING IN FEEDING FLOCKS OF ROOKS, JACKDAWS AND CARRION CROWS. Bird Study 3(3): 180-190, 2 figs. 1956.
Aggressive behavior is described and illustrated. Food-fighting and reproductive fighting seem to be functionally different, for the former occurs when food is least available and when sexual behavior is inhibited. "It is argued that the social hierarchy is an adaptation to reduce the bodily harm from food-fighting, that the existence of food-fighting implies that the birds which do it are liable to come up against the food limit at times, and that when food is short, food-fighting, assisted by the social hierarchy, distributes what food there is unequally, some animals obtaining enough, and others much too little."

Lord, Rexford D., Jr. (Ill. Nat. Hist. Surv., Urbana.) A COMPARATIVE STUDY OF THE EYES OF SOME FALCONIFORM AND PASSERIFORM BIRDS. Am. Midl. Nat. 56(2): 325-344, 14 photos. Oct. 1956.

Skutch, Alexander F. (San Isidro del General, Costa Rica.) THE INCUBATION PATTERNS OF BIRDS. Ibis 99(1): 69-93. Jan. 1957.
Valuable review of incubation behavior of birds of world. "...practically every feasible pattern has been adopted by one species or another."

Woolfenden, Glen E. COMPARATIVE BREEDING BEHAVIOR OF AMMOSPIZA CAUDACUTA AND A. MARITIMA. U. Kans. Publ., Mus. Nat. Hist., 10(2): 45-75, 6 pls., 1 fig. Dec. 1956.
Comparative life history study of sharp-tailed and seaside sparrows in the same area revealed differences, many of them striking, in territoriality, nesting habitat, feeding habitat, care of young, molt, and adaptive coloration. Data are also given on calls, nesting, and growth and development of young.

Yapp, W. B. (U. Birmingham, Eng.) TWO PHYSIOLOGICAL CONSIDERATIONS IN BIRD MIGRATION. Wilson Bul. 68(4): 312-319. Dec. 1956.
Technical discussion of possible means of orientation in overseas flights and energy relations of overseas flights.

BIRDS--MANUALS, FAUNAS, COMMUNITIES

Bourne, W. R. P. THE BREEDING BIRDS OF BERMUDA. Ibis 99(1): 94-105. Jan. 1957.
Annotated list and good discussion of biotic changes on the islands. The resident avifauna is small in species and much altered by man. "The smaller land-birds are unusually abundant and exploit an unusually wide range of habitats in the absence of competition for food from related species... Most birds are unusually tame, and show peculiarities of voice and behaviour; they nest unusually high in trees, and build large exposed nests."

BIRDS--MANUALS, FAUNAS, COMMUNITIES--Continued

Hvass, Hans. BIRDS IN COLOR (Fugle I. Farver). Politikens Forlag (Copenhagen). 192 p., illus. 10.50 Kr. (about $1.50). 1953.
In Danish. Swedish and Finnish editions are available. The front of the book contains pictures of 257 bird species by Tinggaard. The pictures are probably satisfactory for field identification of most birds, but identification marks for field use are not stressed. None of the hawks are shown in flight whereas this is how they are usually seen. Peterson, Mountfort and Hollom, A Field Guide to the Birds of Britain and Europe, should be a much more useful book. In the back of the book are short paragraphs for each species stating distribution, characteristic habitat and habits, food habits, number of eggs, and other interesting facts.--V. F. Flyger.

Rand, Austin L. (Chicago Nat. Hist. Mus.) AMERICAN WATER & GAME BIRDS. E. P. Dutton & Co., N. Y. 239 p., 168 figs. 1956. $11.50.
An attractive picture book with interesting, popular text. The 168 figures are photographs, most of them in color, by various experts. Silhouettes ornament text pages. The groups of birds covered are all those in the A.O.U. Checklist from loons through doves, except Falconiformes. Thus ducks, grouse and their allies are included along with many marsh, shore, and marine birds that are less familiar. The text gives general information on each group and discusses most of the species in readable style. While not a must for an ornithological library, the book should please many a bird watcher and should be a good source of quick information on species for which more specialized references are not at hand. Rand is a respected professional ornithologist and his book is generally reliable. Biologists may disagree with his emphasis at some points. They may feel that he is too complacent about the present status of our wetlands and waterfowl, for example. And they will feel that he is considerably short of the mark when he says that turkeys now can be found only in remote sections of our more southerly states. In other words, although the book has a distinct conservation slant, this aspect is handled casually. The real value of the book is in its many excellent color photos and its general, popular information.

Stephens, T. C., and Wm. Youngworth. BIRDS OF DAKOTA COUNTY, NEBRASKA. Nebr. Ornith. Union, Occ. Pap. no. 3. vi + 28 p., 1 map. 1957. $1.00. [From review by F. J. Pierce, Iowa Bird Life 27(1).]
Annotated list, with bibliography.

BIRDS--POPULATIONS & FLUCTUATIONS

Bond, Gorman M., editor. TWENTIETH BREEDING-BIRD CENSUS. Aud. Field Notes 10(6): 415-436. Dec. 1956.
Forty separate reports of censuses made in a variety of habitats. One is a comparison of breeding-bird populations in 3 deciduous shelterbelts in N. Dak. "Reports from the Northeast indicate the warbler population is back to an all-time peak after last summer's extreme low. In this connection, it appears that the devastation wrought by hurricanes to potential nesting sites is only temporary. Within a year, the opening up of new areas of scrub, edge and sub-climax types of vegetation increases and diversifies the niches available for breeding with the result that the effect on the local bird population is a beneficial one."

Foksowicz, Tadeusz, and Jan Sokołowski. (Z Zakładu Dendrologii i Pomologii Pan, Stacja Zadrzewień Ochronnych w Turwi.) BIRDS IN THE WINDBREAK NEAR ROGACZEW, POZNAŃ VOIVODSHIP. Ekologia Polska - Seria A, 4(3): 1-93, 35 figs. 1956.
In Polish, with English summary and captions. Bird censuses and nest counts were made in a windbreak of trees and shrubs (1800 m. long and 33 m. wide) between cultivated fields. Density of nests was exceptionally high, corresponding to densities found under the best ecological conditions. Nest density varied along the windbreak: Section I, with poor dry soil and no undergrowth had 920 nests per sq. km.; Section II, with somewhat more fertile soil and a thin undergrowth had 1350 nests per sq. km.; Section III, with good and moist soil, abundant vegetation and dense undergrowth had 3076 nests per sq. km.--L. F. Stickel.

BIRDS--CONTROL, MORTALITY

Borg, Karl. (Veterinärmedicinska Anstalt, Stockholm 50, Sweden.) CHLORALOSE FOR CONTROL OF AVIAN PESTS (Om chloralosen och dess användning vid fångst av krak- ochmåsfåglar, duvor etc.). Viltrevy (Stockholm) 1(1): 88-121, 7 figs. Dec. 1955.

In Swedish with English summary. Research report on use of chloralose for catching or killing such birds as crows, magpies, pigeons, and gulls. Lethal dose of α-chloralose is approximately 0.08 g/kg for crow (Corvus corone), 0.11 g/kg for magpie (Pica pica), and 0.2 g/kg for pigeon (Columba livia). For these birds the time between dosing and sleep was about 15-30 minutes, 10-15 minutes, and 0.5-1 hour, respectively. The β-isomer is about 20 times less toxic than the α-isomer. In field tests, baits treated with both isomers were much less effective than baits treated only with α-isomer. A small admixture of the β-isomer apparently makes no difference. "Properly employed, chloralose is a method that is excellent besides being humane for decimating some species of birds and the risk of secondary or inadvertent poisoning is small. A condition for good catches is a careful accustoming to the food and the laying out places before the impregnated foodstuffs are laid out. To catch crows and magpies, a concentration of 0.27% α-chloralose in the food-stuffs was found suitable, whereas for the capture of pigeons it is advisable to raise this concentration to 1.5%." Symptoms of chloralose intoxication are described. Tests, not described in summary, were also made on pheasants and geese.

Dickinson, L. E. UTILITIES AND BIRDS. Aud. Mag. 59(2): 54-55, 86-87. Mar.-Apr. 1957.

Reviews examples of birds short circuiting power lines and solutions that have been found. Short circuits by gulls at a garbage dump were stopped by mounting the wires farther apart on the pole. Eagles perching on transmission towers dropped enough at take-off to touch wires below; perches of 2-inch wooden dowel were mounted on top of the towers to give the extra height needed. Pole damage by pileated woodpeckers is under study at Pa. State U. supported by a Utilities Wood Pole Research Grant. Several promising chemical repellents have been found; use of plastic-impregnated fiberglass poles may be another solution. --L. F. Stickel.

Fisher, James, K. A. Bergman, and others. THE MENACE OF OIL POLLUTION. Aud. Mag. 59(1): 24-25, 34-35, and 59(2): 81-82. Jan.-Feb. and Mar.-Apr. 1957.

James Fisher discusses the importance of oil pollution of the sea and the history of attempts to control it. K. A. Bergman tells how the Coast Guard and Army Engineers enforce laws against oil pollution in U. S. waters, especially in N. Y. harbor. The editor (J. K. Terres) reports several striking instances of oil pollution of U. S. coastal waters and cites 4 references on the subject.

Frings, Hubert, and Mable Frings. (Pa. State U.) RECORDED CALLS OF THE EASTERN CROW AS ATTRACTANTS AND REPELLENTS. J. Wildl. Mgt. 21(1): 91. Jan. 1957.

The assembly call and alarm call of Corvus brachyrhynchos were tape-recorded and later broadcast to wild crows in the field. The assembly call, emitted by crows sighting a cat or owl, proved to be highly attractive, the alarm call repellent. These recorded calls may be useful in controlling movements of these birds.--Authors.

Giban, J. ACOUSTICAL EXPERIMENTS WITH CROWS. Ornithologische Mitteilungen 8(4). Pages not stated. 1956. [From German abstract by Müller-Using in Z. Jagdwissenschaft 2(3).]

In German. Crows were driven from 44 roosts by broadcasting their fear cry. --V. F. Flyger.

Grenquist, Pekka. ON OIL DAMAGE ON FINLAND'S TERRITORIAL WATERS IN 1948-1955. Suomen Riista 10: 105-116, 4 figs. 1956.

In Finnish. Long English abstract on separate mimeo. sheet. Various recent examples of damage to waterfowl are discussed in detail. Many species have suffered, but most serious effects have been on the long-tailed duck. "It should be absolutely forbidden to dump oil or oil waste into the waters of the Baltic and the North Sea."

McClure, H. Elliott. (406th Med. Gen. Lab., A.P.O. 343, San Francisco, Calif.) PROTECTING GRAIN FIELDS IN JAPAN FROM PILFERAGE BY BIRDS. J. Wildl. Mgt. 20(4): 462-464, 3 photos. Oct. 1956.

Rice and other grain fields in Japan are protected from damage by birds through the use of homemade bamboo carbide cannons, nets, noise makers, kites, scarecrows, or by the beating of pans. Many of these devices are cheap, effective, and suitable for small fields.--Author.

McNally, Tom. HOW TO HUNT CROWS. Outdoor Life 119(2): 30-32, 70-71, 8 photos. Feb. 1957.

Remarkable article on how really skilled crow hunters can kill hundreds in an afternoon. Ray and Lou Foehrkolb of Baltimore have crow shooting down to an art and a science. They use careful camouflage of themselves and their blinds, but the big trick is giving the distress call, a groaning sound, on a crow-call. The distress call drives crows wild and brings them right to the guns. The usual "caw, caw" is an alarm note. First the hunters spend a few hours going from field to field, hiding at the edges, and calling in and shooting crows. After a score or so of crows are shot for decoys, the Foehrkolbs head for a hill near a flight line, where hundreds of crows will pass in the evening en route to their late fall and winter communal roosts. There a well-camouflaged blind is set up and decoys are set out, many propped up by wires, a few tossed into trees. Combination of decoys and distress call lures in flight after flight and holds them until each flight is nearly shot out.

Neff, Johnson A., and Brooke Meanley, compilers. RESEARCH ON BIRD REPELLENTS. PROGRESS REPORT NO. 1. US F&WS, Denver 2, Colo. ii + 13 p., mimeo. Oct. 1956.

"The current report is the first of a series planned by the Laboratory to acquaint interested cooperators with the field of bird repellent experimentation. It suggests the need for more restricted use of the term 'repellents' in relation to bird management, and offers specific terminology. It contains a partial review of the literature on bird repellents up to 1955, and, further, includes some previously unpublished items of information culled from the Laboratory's extensive file of progress reports. Other issues of the series will cover specific bird repellent studies carried on since 1951, and will bring up-to-date those field studies on bird repellents in which the Laboratory has been or currently is involved. Following this, an annual progress report on bird repellent studies will be issued." Following the review of information, 47 references are cited.

Neff, Johnson A., and Brooke Meanley. (US F&WS, Denver 2, Colo.) BLACKBIRDS AND THE ARKANSAS RICE CROP. Ark. Agr. Exp. Sta. (Fayetteville), Bul. 584. 1-89 p., 8 graphs, 9 photos. Feb. 1957.

Comprehensive report on 7 years of work. Birds most injurious to rice are red-wing, cowbird, and bronzed grackle. Much information is given on their natural history in relation to rice, populations, roosts, migration into and from area, food habits, and damage done. Lesser amounts of similar information are given on Brewer's blackbird, rusty blackbird, starling, and bobolink, none of which were found to be involved in damage to rice in Ark. Food-habits data for all species are detailed. They show that in some ways the birds' feeding is beneficial. Studies of crop damage reveal that although losses of rice may be serious in certain fields or in certain situations, overall loss is not great with modern harvesting methods. Cultural practices that will help are suggested. Several effective but laborious frightening methods are described; proper use of .22 rifle remains one of the best frighteners. Poisoned grain will give good results under some situations and so will bombing of roosts; both are discussed but specific directions are not supplied. Any form of direct control should be directed at the warm-season population that does the damage; attack on the large winter flocks is unnecessary and unprofitable.

BIRDS--PARASITES AND DISEASES

Baker, J. R. (Central Trypanosomiasis Res. Lab., Tororo, Uganda.) STUDIES ON TRYPANOSOMA AVIUM DANILEWSKY 1885. I. INCIDENCE IN SOME BIRDS OF HERTFORDSHIRE. II. TRANSMISSION BY ORNITHOMYIA AVICULARIA L. III. LIFE CYCLE IN VERTEBRATE AND INVERTEBRATE HOSTS. Parasitology 46(3/4): 308-352, 7 figs. Nov. 1956.

McClure, H. E., W. C. Eveland, and Alice Kase. (406th Med. Gen. Lab., APO 343, San Francisco, Calif.) THE OCCURRENCE OF CERTAIN ENTEROBACTERIACEAE IN BIRDS. Am. J. Vet. Res. 18(66): 207-209. Jan. 1957.

Work done in Japan. Summary: "Sixty-one specimens of bird droppings from 13 species of birds were examined for the occurrence of Enterobacteriaceae. The intestinal flora of these birds resembled that of man and domestic animals and was similar to bacteria found in soils and on vegetables. The results indicated that birds feeding near human habitations pick up human and animal Enterobacteriaceae."

Scholtyseck, Erich, and Wilfried Przygodda. DIE COCCIDIOSE DER VÖGEL. Die Vogelwelt 77(6): 161-175, 9 figs. 1956.

In German. 36% of birds examined were infected with Eimeria. Heaviest Isospora infection was in passerines: 51.6% in general feeders, 42.7% in seed eaters, 31.2% in insect eaters. Free-living birds were more heavily infected with Isospora (31%) than were birds living in captivity (9%). Examinations are listed by species, with indication of numbers examined (captive and free-living listed separately). Seasonal distribution of infections is shown in table and graph.--L. F. Stickel.

GAME BIRDS--GENERAL

Gullion, Gordon W., and Glen C. Christensen. (Nev. Game Comm.) A REVIEW OF THE DISTRIBUTION OF GALLINACEOUS GAME BIRDS IN NEVADA. Condor 59(2): 128-138, 5 maps. Mar.-Apr. 1957.

Good account, with spot maps, of distribution and habitat of each gallinaceous species in Nev.

QUAIL

Elder, James B. (Iowa State Coll.) ANALYSIS OF WHISTLING PATTERNS IN THE EASTERN BOB-WHITE, COLINUS V. VIRGINIANUS L. Proc. Iowa Acad. Sci. 63: 639-651. Dec. 1956.

Whistling patterns at 2 stations in Decatur Co., Iowa, in summers of 1954 and 1955, were analyzed statistically, with special attention to climatic factors. It was found that 3-minute intervals would provide the most information in roadside call counts. Much day to day and hour to hour variation was demonstrated, as was decline in whistling during the season. Analysis of pooled data from both stations indicated that only 20% of variation in whistling could be attributed to weather. At 1 station, most of the variation could be attributed to temperature, but at the other station none of the individual weather variables was significant. The wide variety of statistical techniques employed should be of interest to those undertaking related studies.

Gault, Bill. (Ky. Dept. Wildl. Resources.) KNOW WHAT THE BOBWHITE EATS? Ky. Happy Hunting Ground 12(6): 9,33, 2 photos. Nov. 1956.

Report on foods found in crops of 382 Ky. quail shot during hunting season.

Haugen, Arnold O. (Ala. Poly. Inst.) DISTINGUISHING JUVENILE FROM ADULT BOBWHITE QUAIL. J. Wildl. Mgt. 21(1): 29-32, 2 figs. Jan. 1957.

Wing feathers of about 3% of the bobwhites in Ala. are atypical. This prevents accurate separation of wings into age groups by previously described methods. However, such wings can be distinguished as those of adults or birds of the year by observations on general density of color, shape, and sturdiness of structure of greater upper primary covert No. 7. This feather in adults is darker, has a sleeker appearance because the barbs connect better, and it usually has more whitish, downy tipping on the basal 15-20 barbs. The corresponding feather on young of the year has a uniformly brownish tint, is usually tipped with buffish, and barbs in the vanes separate more easily, thereby presenting a ragged appearance.--Author.

Leopold, A. Starker, and Robert A. McCabe. (MVZ, U. Calif., Berkeley.) NATURAL HISTORY OF THE MONTEZUMA QUAIL IN MEXICO. Condor 59(1): 3-26, 10 figs. Jan.-Feb. 1957.

Major paper on biology of this bird, the U. S. race of which is Mearn's quail. Data are based on extensive field work, laboratory studies, and review of literature. Summary: "The Montezuma Quail is a common resident of the Mexican highlands, specifically of the pine-oak vegetation zone. The association between this quail and the pine-oak forest is so universal that the bird may be considered an avian indicator of the type. Within the pine-oak zone, the highest quail populations are found in ungrazed areas where there occur many bulb-bearing forbs and sedges in the understory. In the dry season Montezuma Quail feed heavily on bulbs which they dig from the ground. Grazing eliminates these plants and hence eliminates the quail. Winter coveys of Montezuma Quail are small (7.6 birds) and seem to be family units. Pairing occurs in April and May, nesting from May to July. The period of incubation is 25 to 26 days. Most young hatch in July and August when the summer rains have induced plant growth and there is an abundance of insects on which chicks and adults feed. Both parents help rear the chicks. By October the young are essentially grown and coveys are established on winter ranges. At this time the birds have shifted back to bulbs as the staple diet. Populations vary in density from place to place according to the quality of the habitat. They also vary locally from year to year with effects of weather. Either cold, snowy winters or dry summers will suppress populations." Data are also given on taxonomy (map), weights, flight, voice, size of range, growth of young, size of broods, characteristics of age groups, lack of water need, sex and age ratios, and mortality factors.

Murray, Robert W., and O. E. Frye, Jr. (Fla. Game Comm.) THE BOBWHITE QUAIL AND ITS MANAGEMENT IN FLORIDA. Fla. Game & Fresh Water Fish Comm., Game Publ. no. 2. 1-56 p., 28 figs. 1957.

An attractive and well-published bulletin. It will be of much interest to technicians although it is designed mainly to present modern management methods and concepts to hunters. The first few pages review quail biology, but much of the paper consists of instructions for managing habitat for quail on crop, grazing, and forest lands. In a short section on restocking, the authors conclude that "restocking is largely, if not entirely, unnecessary in Florida. It is a very impractical and ineffective means of attempting to increase quail populations." Predator control also is given little weight. Murray and Frye hold that summer and fall habitat is the important key to quail management in Fla. They believe that breeding stock is always adequate to produce more young than can survive and that renesting compensates in large part for nest destruction. Thus the hunting-season population depends primarily on capability of the rearing habitat. Artificial feeding is discussed in detail; it is considered valuable where cover is abundant and food is scarce. The concluding thought in the bulletin is that "there must be community effort and mutual understanding of each others problems between landowner, sportsmen, and conservation groups and agencies if quail hunting is to survive for the average man."--Fred H. Dale.

Yadon, V. L. (Ore. State Coll.) THE ARTIFICIAL ROOST--AN AID IN POPULATION STUDIES. J. Wildl. Mgt. 20(4): 466. Oct. 1956.

Coveys of valley quail, Lophortyx c. californica, were counted as they flew in groups of 2 and 3 into artificial roosts that were constructed in central Ore.--Author.

PHEASANTS

Crispens, Charles G., Jr. (State Coll. Wash.) PROLACTIN: AN EVALUATION OF ITS USE IN RING-NECKED PHEASANT PROPAGATION. J. Wildl. Mgt. 20(4): 453-455. Oct. 1956.

112 pen-reared hens and 11 wild hens received injections of prolactin. 82 of these birds became broody and were released with 820 pheasant chicks on the Delaware Reservoir Area, Ohio. Only 2 of the estimated 396 males released were killed during the small-game hunting season. Possible explanations are discussed. --C. G. Crispens, Jr.

Hildebrand, Milton. (U. Calif., Davis.) DETERMINING THE SEX OF DRESSED PHEASANTS. Calif. Fish & Game 43(2): 131-137, 4 figs. Apr. 1957.
Analysis of various methods. Urogenital systems are shown in a drawing and discussed. When urogenital structures are not available, linear measures of any of several bones nearly always offer certain identification. Data are tabulated for five suitable measurements and the method of interpretation is discussed. No useful difference in relative body proportions could be found. Pelvic variation and estrogen-induced hyperossification are useful only during the laying season.

Hine, Ruth L. (Wis. Cons. Dept.) THE HUNTING-SEASON TOLL OF HEN PHEASANTS. Wis. Cons. Bul. 21(10): 7-9, 1 photo. Oct. 1956.
Fluoroscopy of pheasants to find how many carried shot made it possible to estimate that 14% of hen pheasants in Wis. are shot during hunting season. The comparable figure for S. Dak. was 8-10%.

Kozicky, Edward L., and George O. Hendrickson. (Nilo Farms, E. Alton, Ill.) PHEASANT NESTING AND PRODUCTION IN WINNEBAGO COUNTY, IOWA, 1940 VERSUS 1954. Proc. Iowa Acad. Sci. 63: 669-680, 2 graphs. Dec. 1956.
Number of fields in the 1,520-acre study area changed from 108 to 67, which meant less edge and less cover. Unfavorable spring weather, especially a cold May, reduced nesting success in 1954. Increase of tractor-drawn mowers in the 15-year period reduced nesting success from 20 to 7% in hayfields and increased injury and mortality to nesting hens from 8 to 23%. From nesting data, one would have expected 25-30 fewer pheasants per section in 1954. "Fall pheasant population estimates, 210 per section in 1940 and 100 per section in 1954, are not commensurate with the measurable differences. Possible reasons for the discrepancy are discussed." Other nesting statistics and rates of juvenile mortality were about the same in 1954 as in 1940.

Longley, Wm. H. (Minn. Div. Game, Kasson.) COOPER'S HAWK PREYING UPON A WINTER PHEASANT FLOCK. Flicker 28(4): 164. Dec. 1956.
Describes 1 incident and gives data on winter losses of pheasant flocks in Minn. A flock of 73 lost 7 hens Jan.-April--6 apparently to hawk, 1 to auto. Losses did not occur in most-used types of cover. Two flocks totaling about 110 lost only 2 hens and 1 cock--1 to dog, 1 to auto, 1 to unknown factor.

Mason, Charles I., and Earl R. Holm. (N. Y. Cons. Dept.) COMPARATIVE VALUE OF STOCKING THREE TYPES OF GAME FARM PHEASANTS. N. Y. Fish & Game J. 4(1): 31-42, 2 figs. Jan. 1957.
From author's abstract: "The three types used comprised (1) State game farm birds released as half-grown juveniles, (2) State game farm birds held and released as adults, and (3) purchased adults... The purchased adults gave the greatest return per stocking dollar. The birds released as half-grown young ranked second. The State game farm stock released as adults gave the best rate of return to the gunner, but the cost of these birds was very high as a result of heavy losses on the island used for holding them during the late summer and early fall. Hunters were well satisfied with the sporting quality of all three groups."

Reynolds, Temple A. (Utah Dept. Game.) THE EFFECTS OF HUNTING SEASON LENGTH ON COMPARABLE PHEASANT POPULATIONS. Utah Dept. Fish & Game, Dept. Inf. Bul. no. 27. vii + 45 p., 13 figs. July 1956.
Digest from author's summary: Study areas were established in Cache Co., Utah (where there was a 5-day pheasant season) and in Franklin Co., Idaho (15-1/2 day season). Spring breeding populations were roughly equal in the two areas. Sex ratios and brood sizes were also similar. Harvests were nearly equal in the two areas: 75% harvest in Utah and 78% harvest in Idaho in 1954; 69% harvest in Utah and 62% harvest in Idaho in 1955. A majority of hunters and landowners in both areas were in favor of their present lengths of season. The author believes there is no biological evidence to show why pheasant seasons in either area should be held to their present lengths.--L. F. Stickel.

Smith, Ralph H. (N. Y. Cons. Dept.) AN EARLY ATTEMPT TO INTRODUCE PHEASANTS TO NORTH AMERICA. N. Y. Fish & Game J. 4(1): 119-120. Jan. 1957.
Between 1728 and 1731 in N. Y.

GROUSE, PARTRIDGE, ETC.

Fogg, Forrest F. (N. H. Game Dept.) RESULTS OF A STUDY OF RUFFED GROUSE POPULATION TRENDS IN NEW HAMPSHIRE FOR THE PAST EIGHT YEARS. Proc. NE. Sec. Wildl. Soc. et al. 1-7 p., 5 graphs, mimeo. Jan. 1957.

Summary: "The Long Line Brood Census is apparently one of the most valid methods of determining population trends which has been conceived to date. Since [it] only uses two men and one vehicle to census a state the size of New Hampshire it can be considered as a very reasonable census method. Table I gives the number of broods and flushes found in each region for the last eight years. Table II gives the mileages of each region and the average number of miles hiked per grouse brood and flush. It was found that the trend in average number of miles hiked per grouse brood, on a statewide basis, decreased from 1949 to 1952 and then started increasing until 1954. It then started to drop again in 1956 possibly indicating that ruffed grouse are again on the increase. Table III indicates that the percentage of females to males in the fall wing and tail study fluctuates each year. The female percentage has risen steadily every other year since 1949. Table IV indicates a decided drop in the immature to adult ratio for the years 1953 and 1954. The Ruffed Grouse Study has indicated that for the period of time which this investigation has been run, the peak years occurred during the years 1950 to 1952 and the low occurred during the years 1953 to 1955."

Höglund, Nils H. BODY TEMPERATURE, ACTIVITY AND REPRODUCTION OF THE CAPERCAILZIE. Viltrevy (Stockholm) 1(1): 1-87, 8 figs., 58 graphs. Dec. 1955.

Long detailed paper in Swedish. Has legends and 6-p. summary in English. Experiments were conducted with capercailzie chicks to ascertain age at which temperature control was established, effects of weather on body temperatures and activities of chicks, and hence the effects of weather on survival of young. The normal mean body temperature of 41.6°C. is reached by the 18th day. In young chicks, temperature varies during the day, beginning to fall a few hours before sunset and beginning to rise a little before dawn. Low environmental temperatures (8-10°C., for example) cause chilling of young chicks and force them to take cover under mother. Moisture has a similar effect. Chicks can regain heat in half the time the chilling has lasted. No injurious direct effects of chilling are apparent. However, if chicks have to spend too much time under the hen they may die for lack of food. Climatic conditions may limit numbers and range of the species through this effect. Climate and climatic change in Sweden are discussed in this connection; June temperatures seem to be decisive. The paper also describes growth and plumage development of young in relation to heat control.

Höglund, Nils H. ON SEX-DISTINGUISHING CHARACTERS IN CAPERCAILLIE CHICKS. Viltrevy (Stockholm) 1(2): 150-157, 8 figs. Nov. 1956.

In Swedish with English summary and legends.

Höglund, Nils H. INFLUENCE OF DIFFERENT COLOURS ON THE CAPERCAILZIE CHICKS CHOICE OF FOOD. Viltrevy (Stockholm) 1(1): 122-128, 8 figs. Dec. 1955.

In Swedish with English summary. Attractiveness of glass beads of 6 colors was tested. Green was far the most attractive color. "The first efforts by the chicks to take to themselves a definite bead were directed in 23 cases to green, 3 to red, 1 to yellow and 1 to black." Black beads were quite repellent under some circumstances. Plants were also tested for attractiveness. Green parts were most attractive. The small chicks could not pick off green parts, however, and soon learned to pick at and eat the fragile flowers of blueberry. "The first instinctive hunt by the capercailzie chicks for food appears to be aroused by the sight of an object of a certain colour, particularly green. The first instinctive movements are followed very quickly by a purposefully directed hunt for food, based on the availability and suitability of the various objects as food."

Johnson, Morris. (N. Dak. Game Dept.) THE HUN AND ITS LIMITING FACTORS. N. Dak. Outdoors 19(10): 7-9, 3 photos. Apr. 1957.

Good popular review of population biology of Hungarian partridge.

Koivisto, Ilkka. LOCAL MOVEMENTS IN CAPERCAILLIE POPULATIONS. Suomen Riista 10: 179-184, 3 figs. 1956.
In Finnish. English abstract on separate mimeo. sheet. From abstract: Twenty marked capercaillie were recovered. All hens traveled a considerable distance (6-22 km.) from their birthplace. The movement took place in the first autumn of life, or to some extent during the following winter. Cocks remained near the place of birth, and did not take part in this movement. In blackgame, the difference between the sexes is not as distinct, although there are indications of similar behavior. Limiting shooting to male capercaillie is not recommended.

Koskimies, Jukka. DETERMINING THE AGE OF GALLINACEOUS BIRDS BY THE OUTER PRIMARY METHOD. Viltrevy (Stockholm) 1(2): 158-161, 1 fig. Nov. 1956.
In Swedish with English summary. Summary: "In gallinaceous birds the two outermost primary feathers are not shed in the autumn moult of the first year. In juvenile (first year) birds these two primaries have clearly pointed tips, whereas the tips of the corresponding feathers of the adult plumage are rounded and slightly broader (Fig. 1). In many species there are additional distinguishing characteristics in the colouration of these primaries. The outer primary method can be successfully used in analysing the age ratios in gallinaceous birds during the open season on the basis of wing samples collected from hunters."

Marcström, Vidar. OM KROPPSTEMPERATUREN HOS TJÄDERKYCKLINGAR TETRAO UROGALLUS LIN. VID KLÄCKNINGEN OCH OMEDELBART DÄREFTER. Viltrevy (Stockholm) 1(2): 139-149, 5 figs. Nov. 1956.
In Swedish with English summary and legends. Experimental study of body temperatures of newly hatched capercaillie chicks at various levels of activity and humidity.

Seiskari, Pertti, and Jukka Koskimies. ECOLOGICAL RACE CHARACTERISTICS OF THE FINNISH CAPERCAILLIE. Suomen Riista 10: 34-43, 11 figs. 1956.
In Finnish. English abstract on separate mimeo. sheet. From abstract: "The capercaillie population of the southern part of the country is characterised by its feeding in the grainfields and the eating of aspen leaves. The capercaillies of the northern part of the country spend their nights as a rule burrowed under the snow, a habit that is rare farther south. ...fluctuation in numbers...clutch size and the flocking phenomena, is different in the area of the two populations."

Sharp, Ward M. (Pa. State U.) HABITAT MANAGEMENT FOR RUFFED GROUSE IN THE POLE STAGE FOREST. Proc. NE. Sec. Wildl. Soc. et al. 1-8 p., mimeo. Jan. 1957.
Two study areas of 735 acres each were set up in the barrens of cent. Pa. One area was manipulated by creation of openings of 1/4 to 1 acre. Openings were made in different years and thus provided a series of stages. They were made in ways varying from light release cuttings to bulldozing. Light release cuttings were least satisfactory, owing to quick closure of canopy. Openings of 1 acre were located strategically over area, with each surrounded by smaller openings. The managed area was used by 3 to 8 times as many grouse broods as was the unmanaged area. Actual number of broods using managed area varied from 8 to 21 in 6 years, with no clearly demonstrable trend of increase during the period. Deer browsed heavily in the clearings and were able to control sprout growth when herd was high. Cottontails increased in response to clearings and had serious effect on seedlings; this effect might easily pass unnoticed, but is great enough to account for scarcity of many native shrubs. Clearings now cover 7.78% of managed area; 10%, cut on rotational basis, is considered optimal. Foresters easily can spare this much of a multiple-use forest, especially since the work improves watershed conditions.

Talmadge, Robert R. (Willow Creek, Calif.) NESTING OF THE RUFFED GROUSE IN CALIFORNIA. Condor 59(1): 67-68. Jan.-Feb. 1957.
Describes 3 nests and their locations.

Yeatter, R. E. (Ill. Nat. Hist. Surv., Urbana.) IS THE PRAIRIE CHICKEN DOOMED? Ill. Wildl. 12(2): [7-8], 3 maps. Mar. 1957.
History of prairie chicken in Ill. and maps of distribution in 1912, 1940, and 1956. "The management measure necessary to preserve a few colonies for the future is to supplement nesting cover... At present it appears that often an effective refuge could be provided by leasing...a tract of 40 acres in each square mile. Such tracts should be maintained for a period of years in redtop and clover or other soil conserving forage crops, and left unharvested at least during the spring and early summer."--L. F. Stickel.

Yocom, Charles F. (Humboldt State Coll.) THE SAGE HEN IN WASHINGTON STATE. Auk 73(4): 540-550, 1 map, 1 pl. Oct. 1956.
Review of past and present status and distribution. Intensified land use reduced and is still reducing the amount of sage grouse habitat. The birds declined or disappeared in many areas. In some areas, however, farming operations apparently aided these grouse, especially where farmland adjoined native rangeland. Populations seem to have increased in the better remaining habitats in recent years. Open seasons have been permitted in certain counties; the kill was about 4,000 in 1953. Sage grouse in Wash. apparently do not undertake long seasonal migrations today. Detailed records of past and present status are presented by counties.

TURKEY

Allen, Ralph H. (Ala. Dept. Cons.) IS A SPRING GOBBLING SEASON BIOLOGICALLY SOUND? Ala. Cons. 28(3): 22-23. Dec.-Jan. 1956-57.
Should turkeys be hunted in the spring as well as in the fall? "1. Figures available indicate that a spring turkey season does not retard the turkey population. 2. Hunters disturb a very minimum of hens nesting during a spring season. 3. There is a surplus of mature males that should be harvested and such birds are most easily taken during the spring season. ...all evidence leads one to conclude that a spring gobbling season is biologically sound."

Bailey, R. Wayne. (W. Va. Cons. Comm.) POPULATION CHARACTERISTICS OF THE WILD TURKEY IN WEST VIRGINIA. Proc. NE. Sec. Wildl. Soc. et al. 1-12 p., 1 graph. Jan. 1957.
Turkeys seem to be more than holding their own in W. Va. despite a long season, considerable poaching, and abandonment of several refuges. Population rose from about 6,000 in 1945 to some 10,000 in 1955. The latter represents 2 turkeys per mile of forest. Kills also rose during the period and reached a peak of 1,600 (16%) in 1955. Broods were consistently larger in n. hardwood forests than in oak or oak-pine forests, and populations were usually larger in n. hardwoods. Studies of age and sex ratios (several tables) revealed wide differences in productivity of apparently similar areas. Proportions of immatures varied from 28-71%, av. 55%, with immature females dominant. Broods in Sept. av. 7 young per hen with young; this is understood to indicate that only 1 hen in 3-4 reared young to hunting season. Cripple loss ran 20-30% rather consistently. Transplanting of wild birds has been successful; now that it is low in cost thanks to cannon-net trapping, use of game-farm birds is open to question, and such birds are not used in W. Va. Movements of 9 banded birds av. 4.5 miles. Calculations from banding indicated larger populations than suspected, but such calculations are uncertain owing to wide travels of the birds.

Burget, Martin L., compiler. (Colo. Game Dept.) THE WILD TURKEY IN COLORADO. Colo. Game & Fish Dept., PR Proj. W-39-R. iv + 68 p., 3 graphs + 23 photos, proc. Jan. 1957.
Long, useful summary of data from turkey management and research program, 1941-1956. History in Colo., present range, and future prospects are discussed. Life history topics treated include: flocking habits, vocal sounds, quarrelsomeness, roosting habits, reproduction and reproductive behavior, molting, weights, foods and feeding habits, predators, diseases and parasites. Techniques discussed are: census methods, trapping, handling, and releasing. Management recommendations emphasize range reseeding and replanting. Advantages and disadvantages of winter feeding are considered.--L. F. Stickel.

Knoder, Gene. (Ohio Div. Wildl.) LAST OF THE FARM TURKEYS. Ohio Cons. Bul. 21(3): 12-13, 4 photos. Mar. 1957.
Ohio has given up the attempt to establish wild turkeys from game-farm stock and is using wild-trapped stock from W. Va.

Meanley, Brooke. (P. O. Box 1365, Alexandria, La.) FOODS OF THE WILD TURKEY IN THE WHITE RIVER BOTTOMLANDS OF SOUTHEASTERN ARKANSAS. Wilson Bul. 68(4): 305-311, 3 photos. Dec. 1956.
Based on contents of 1026 droppings and 22 crops and gizzards collected 1950-55. "Acorns, sugarberries, pecans, poison ivy fruit, blackberries and blades of grass were important foods in the first bottoms; seeds of crab-grass dominated droppings collected from sand bars in summer and fall; while in dry ox-bow lake beds, feather-grass seeds were the principal food in the fall, and styrax fruit in the summer."

Roberts, Harvey A. (Pa. Game Comm.) REPORT ON WILD TURKEYS. Pa. Game News 27(12): 44. Dec. 1956.
Estimates indicate that kill of 50-60% of turkeys in s.-cent. Pa. accounts for failure of turkeys in that region to reach satisfactory levels. On the other hand, kill of 10-20% in n.-cent. Pa. has permitted good build-up of population.

Roberts, Harvey A. (Pa. Game Comm.) FACTORS AFFECTING THE WILD TURKEY POPULATION IN PENNSYLVANIA. Proc. NE. Sec. Wildl. Soc. et al. 1-9 p., mimeo. Jan. 1957.
Factual review of research findings and management results. "In summary, three tools of management appear to be partially responsible for the rescue and subsequent growth of the wild turkey populations. These are rigid law enforcement, maintenance of numerous, small refuges and the introduction of the first quality stock reared at the Game Farm. A complex of other factors, such as the maturation of our forests, a succession of comparatively mild winters and favorable nesting seasons and the general inaccessibility of large portions of the northcentral range, have all played their parts in the re-establishment and growth... Conversely, hunting pressure and accessibility, which result in an excessive harvest, are two of the major factors affecting the wild turkey population in the long established southcentral range. At present, losses from disease, predation, poaching and starvation appear negligible."

Schultz, Vincent, and Robert D. McDowell. (U. Md.) SOME COMMENTS ON A WILD TURKEY BROOD STUDY. J. Wildl. Mgt. 21(1): 85-89, 1 graph. Jan. 1957.
Presents a statistical analysis of some wild turkey brood data collected in Va. during 1953, and discusses the appropriateness of utilizing brood data on a statewide basis. Broods were classified on the basis of number of hens accompanying each brood. There was a statistically significant interaction of brood classification and month of collection, which implies that month to month changes in the average number of young per observation were different for the different brood classifications. In regard to single-hen broods, there was insufficient evidence to establish the existence of a trend in brood size during the study period throughout the state. The extreme variation in brood size in all months of study indicates that brood reduction was not similar throughout the study region or possibly any subregion within the state.--Authors.

Shaffer, C. H. (Va. Comm. Game.) ARE WE KILLING THE HENS WITH THE GOLDEN EGGS? Va. Wildl. 17(10): 10-11, 20, 23, 3 photos. Oct. 1956.
Va. turkey populations, especially in e. Va., are in danger of extermination for several reasons, which Shaffer discusses. One sound conservation method would be to refrain from shooting hens. The author proposes that sportsmen do this voluntarily and that the Game Commission consider making this a legal requirement. Distinguishing the sexes is not difficult when hunting is done by calling turkeys to a blind; this is the best form of turkey hunting anyway.

Simpson, D. F., D. W. Anthony, and Franklin Young. (Gainesville, Fla.) PARASITISM OF ADULT TURKEYS IN FLORIDA BY LEUCOCYTOZOON SMITHI (LAVERN AND LUCET). J. Am. Vet. Med. Assn. 129(12): 573-576, 2 photos. Dec. 1956.
Infections studied were in domestic flocks, but wild turkeys were thought to be source of infection. L. smithi is believed to act as a stressing agent that increases the severity of coexisting infections. Probable vector in cases reported here was Simulium slossonae.

Thomas, Carl H. (Okla. A & M Coll.) THE POPULATION UNIT IN A WILD TURKEY CENSUS. Proc. Okla. Acad. Sci. 35: 166-168. 1954. [1956?]

Winter turkey flocks are discrete units that occupy specific home ranges. Numbers of flocks, sizes of flocks, and home ranges can be ascertained. Data on these subjects provide the best bases for calculating population densities. Applying this principle to field information from The Wichita Mtns. Refuge, Okla., where av. flock range was about 1,256 acres and there were 14 flocks, it is estimated that there were 322 turkeys. Turkeys lived in 30% of the refuge, and in this area the density was 1 bird per 55 acres.

DOVES AND PIGEONS

Goodwin, D. THE SIGNIFICANCE OF SOME BEHAVIOUR PATTERNS OF PIGEONS. Bird Study 3: 25-42. 1956. [From notice by L. McC., Ibis 99(1).]

"Detailed descriptions of social behaviour patterns in some species of Columba and Streptopelia. The derivation and significance of head shaking, nodding, displacement preening, caressing and 'driving' are discussed."

Hanson, Harold C., and Charles W. Kossack. (Ill. Nat. Hist. Surv., Urbana.) METHODS AND CRITERIA FOR AGING INCUBATED EGGS AND NESTLINGS OF THE MOURNING DOVE. Wilson Bul. 69(1): 91-101, 5 figs. Mar. 1957.

From author's summary: With the use of a portable egg candler and the aid of photographs of incubated eggs taken by means of transmitted light, incubation stages, except for 7 through 10 days, usually can be determined with accuracy. Nestling mourning doves are aged by comparing them with photographs of nestlings of known age, with the additional aid of an aging gauge that shows the av. and range of combined body and tail length. The use of elastic adhesive tape in banding nestling doves is described.

Koppelberger, Vic. THE MOURNING DOVE IN OHIO. Ohio Cons. Bul. 21(1): 4-5, 30-31, 4 photos. Jan. 1957.

Account of habits and quantitative report (with tabular data) on nesting studies on n. Ohio. Unfavorable spring and summer weather caused greater nesting losses than any other factors. Evidence was obtained that doves did not necessarily nest in the same areas in different years even if habitat remained suitable. Roadside nesting definitely has been reduced by treatment of roadsides with herbicides.

Kossack, Charles W. (715 Division St., Barrington, Ill.) A MOURNING DOVE BANDING PROJECT. Inland Bird Banding News 27(1): 1-10, 1 fig. Feb. 1955.

Good management of mourning doves requires much more banding of nestlings and breeders. This leaflet is written to stimulate amateur participation in dove banding and to tell just how to go about it. It discusses how to locate nests, how to band nestlings, how to trap older birds, how to ascertain age of doves, what traps are best, and what equipment is needed.

Longwell, J. R. (Md. Dept. Res. & Ed., Solomons.) MOURNING DOVE REPORT 1956 HUNTING SEASON. Md. Tidewater News 13(5): 2, 5-6. Jan.-Feb. 1957.

Data on age ratios and hatching dates; based on 785 wings. Also discussion of age ratios, 1949-56, and of factors that affect the data.

Lowe, Jack I. (U. Ga.) BREEDING DENSITY AND PRODUCTIVITY OF MOURNING DOVES ON A COUNTY-WIDE BASIS IN GEORGIA. J. Wildl. Mgt. 20(4): 428-433, 2 graphs. Oct. 1956.

Breeding density and number of young produced in 1954 were determined by the territory-mapping method and by checking nests at 2-week intervals throughout the breeding season. An av. of 2.5 pairs per 100 acres was found on 8 farmland areas totaling 1,200 acres. An estimated 2.0 young per pair were produced in the year. This verifies the low production rate previously reported for the region. By relating nesting density to number of birds heard calling during standard call-counts (call-count index), it was found that for each calling dove heard at a listening station in the center of a 150-acre area there was an av. of 1.74 pairs nesting on the area. Using this ratio, the av. number of pairs per 150-acre area was estimated for a 20-mi. transect for 4 years, as follows: 1951, 2.30; 1952, 2.14; 1953, 1.83; 1954, 2.33. Total 1954 population for the county, which has 107,000 acres of farmland, was estimated to be 3,500 breeding adults and about same number of locally produced juveniles.--Author.

Nelson, Daniel J. (U. Ga.) SOME ASPECTS OF DOVE HUNTING IN GEORGIA. J. Wildl. Mgt. 21(1): 58-61. Jan. 1957.

Mourning dove kill data were obtained for 4 hunting seasons, Sept. 1949 through Jan. 1953. Data were obtained from 2,329 hunting efforts in which 10,847 doves were bagged. A higher kill per gun hour was found during Sept. seasons than in Dec. and Jan. and is considered as an index to abundance. Dispersal of doves and natural mortality are thought to be responsible for reducing kill per gun hour during Dec. and Jan. A similar kill per gun hour during the same open-season dates was usually found in the piedmont of n. Ga. and the coastal plain of s. Ga. Apparently juvenile doves were not easier to bag than adults.--Author.

Peters, Harold S. THE MOURNING DOVE HUNTER KILL--1955. US F&WS, Atlanta 23, Ga. 4 p. Nov. 1956.

Tabulation of estimated kill and population trend by states. The approximate total of 19 million doves bagged represents an increase over estimates made by others in 1949 and 1944. It is greater than the kill of any other migratory game bird and is greater than the kill of ducks, although doves were hunted in only 29 states and Ontario. Crippling loss is thought to av. about 26%. Population trend and hunting pressure are believed to have increased in the last 5 years in most states.

WATERFOWL

Adams, Bud. (N. Dak. Game Dept.) WILL HALF-DAY SHOOTING AID GOOSE HUNTING? N. Dak. Outdoors 19(8): 10-11, photo & maps. Feb. 1957.

Some of the best goose hunting lakes in the Devils Lake area in n. N. Dak. had goose shooting limited to forenoons during the regular season. Designed to give geese a chance to feed unmolested during part of the day, the experiment was judged a success by duck hunters and game biologists alike. Hunters felt it would cause the geese to stay longer in the area; over 90% wanted this type of season next year.--L. F. Stickel.

Anderson, Roy C. (Ont. Res. Found., Toronto 5.) THE LIFE CYCLE AND SEASONAL TRANSMISSION OF ORNITHOFILARIA FALLISENSIS ANDERSON, A PARASITE OF DOMESTIC AND WILD DUCKS. Can. J. Zool. 34(5): 485-525, 20 figs. Oct. 1956.

Long, detailed report of experiments.

Anderson, William. (Calif. Dept. Game.) A WATERFOWL NESTING STUDY IN THE SACRAMENTO VALLEY, CALIFORNIA, 1955. Calif. Fish & Game 43(1): 71-90, 5 figs. Jan. 1957.

Nesting was studied in 1955 on 9 plots that were scattered over the valley and totaled 3,560 acres. Results are discussed and presented in 15 tables. 333 duck nests, 93% mallard, were found. 38.4% of clutches hatched, 52.3% were destroyed, and 9.3% were deserted. Predation by mammals, especially skunks, brown rats, and raccoons, was main cause of nest destruction. Peak of hatch was between May 20 and July 10. Average number hatched was 7.2 per successful nest. 85 mallard broods av. 6.1 young at 1 week and apparently dwindled to av. of 3.5 at 4 weeks. 150 coot nests found were all on check dams of rice fields. 41% hatched, 54.3% were destroyed by predators, and 4.8% were deserted. Average number hatched per successful nest was 7.9. It seems that more intensive predator control is key to better duck production in the valley. Since trapping is too costly, suitable use of poisons should be worked out experimentally.

Baillie, James L. (Roy. Ont. Mus., Toronto.) ON THE SPRING FLIGHT OF BLUE AND SNOW GEESE ACROSS NORTHERN ONTARIO. Can. Field-Nat. 69(4): 135-139, 1 map. Oct.-Dec. 1955 [Dec. 1956].

Data on route taken in migration.

Barske, Philip. (751 Connors Lane, Stratford, Conn.) WATERFOWL WASTED BY CRIPPLING. Cons. Volunteer 20(114): 52-56. Nov.-Dec. 1956. [Also published in several other state game journals.]

Data from various studies indicate that the national av. for crippling loss is around 25%. Reasons for such losses are discussed and suggestions are made to hunters for reducing the wastage by better hunting practices.

Beckley, O. E. WOOD DUCK NESTING BOX PROGRAM / PROGRESS REPORT 1953-1955. Conn. State Bd. Fisheries & Game. 2 p. of text, 19 p. of tables, mimeo. Mar. 1956.

As determined by inspections in winter, usage of 415 nest boxes in 1955 was as follows: 51.6% of boxes were used by wood ducks, 16.6% were used by other animals, and 1.9% gave evidence of predation. Nest boxes were situated on 156 ponds and marshes, usually with 1-4 boxes per pond. In the 4th year of the program, predation by raccoons occurred at only 4 locations.--Clark G. Webster.

Benson, Dirck, Donald D. Foley, and Donald L. Schierbaum. (N. Y. Cons. Dept.) DUCK SEASON PROBLEMS IN NEW YORK. Proc. NE. Sec. Wildl. Soc. et al. 1-6 p., mimeo. Jan. 1957.

Scheduled for publication in N. Y. Fish & Game Journal.

Bergman, Göran. ON THE INTRODUCTION OF GREY LAG GOOSE. Suomen Riista 10: 121-128, 1 photo. 1956.

In Finnish. Long English abstract on separate mimeo. sheet. Gives many specific suggestions for rearing and releasing these birds for reestablishment in the wild.

Boyd, H. (Wildfowl Trust, Slimbridge, Gloucestershire, Eng.) STATISTICS OF THE BRITISH POPULATION OF THE PINK-FOOTED GOOSE. J. Anim. Ecol. 25(2): 253-273. Nov. 1956.

Digest from author's summary: More than 14,800 geese were marked in Britain and Iceland, 1950-54. Human activities accounted for 89% of 982 reported casualities. Other causes of adult losses are probably of minor importance. Estimates of adult death rates from recoveries of marked birds are made by the use of two mathematical models. Estimates from one of these compared well with capture-recapture estimates. Death rates based on capture-recapture data are 21 ± 12% per yr. for geese more than 1 yr. old and 44 ± 20% for the 4-16-month age group. Population size is estimated at 37,200 ± 6500 on Nov. 1, 1952, and 49,600 ± 8500 on Nov. 1, 1953. Sex ratios are nearly 1:1. Most individuals do not breed until 32 months old. Observed mean clutch size is 4.5, substantially higher than required for replacing estimated losses. It is concluded that complete nesting failure of a substantial part of the potential breeding population is usual, even in climatically favorable years.--L. F. Stickel.

Boyd, Hugh. (Wildfowl Trust, Slimbridge, Eng.) MORTALITY AND KILL AMONGST BRITISH-RINGED TEAL ANAS CRECCA. Ibis 99(2): 157-177, 2 graphs. Apr. 1957.

11,500 teal were banded 1945-55. Cage traps seem to select older birds and males. Decoys show much less selectivity. Mean annual survival rate of males is 0.507; of females, 0.430. Survival may be rather less in year after first Sept. of life. Survival rate for one area varied from year to year and was highest during World War II. Reports suggest that nearly all deaths are caused by man, especially in Sept.-Mar. Such losses are 10 times as likely to be reported as others. True proportion of losses attributable to man probably is about 3/5 for males and 1/2 for females. Losses from Sept.-Mar. account for about 2/3 of annual total for males and over 1/2 for females. Losses in summer are inversely proportional to those of winter before: heavy winter kill is offset by reduction in summer casualties, which include many natural deaths. The paper confirms previous findings that female losses exceed male, that adult survival is nearly constant after first autumn, and that senility is not important.

Burgess, G. D. (Ent. Lab., Saskatoon, Sask.) OCCURRENCE OF LEUCOCYTOZOON SIMONDI M. AND L. IN WILD WATERFOWL IN SASKATCHEWAN AND MANITOBA. J. Wildl. Mgt. 21(1): 99-100. Jan. 1957.

Leucocytozoon simondi was observed in blood smears of a mallard, a pintail and 2 green-winged teal captured in s. Sask. and sw. Manitoba. In the same area, blood smears from 698 other wild waterfowl of 13 species failed to reveal haematozoa.--Author.

Coulter, Malcolm W. (U. Maine.) PREDATION BY SNAPPING TURTLES UPON AQUATIC BIRDS IN MAINE MARSHES. J. Wildl. Mgt. 21(1): 17-21. Jan. 1957.
Study of 157 gastrointestinal tracts from Chelydra serpentina taken in Mains during early summer revealed that 27% contained remains of birds, nearly half of which were ducks. Up to 13% of the estimated duckling population on sample areas was taken by turtles in periods of 25 days or less. Significant predation upon ducklings is believed to be limited to local areas where both ducklings and turtles are abundant.--Author.

Cowan, Archibald B. (U. Mich.) REACTIONS AGAINST THE MEGALOSCHIZONTS OF LEUCOCYTOZOON SIMONDI MATHIS AND LEGER IN DUCKS. J. Infect. Dis. 100(1): 82-87, 8 figs. Jan.-Feb. 1957.

Cronan, John M. (R. I. Div. Game.) THE EFFECTS OF PREDATOR GUARDS ON WOOD DUCK BOX USAGE. Proc. NE. Sec. Wildl. Soc. et al. 1-4 p., mimeo. Jan. 1957.
Good experiments were conducted to compare usage of boxes with and without wooden tunnel entrances. Results were tested statistically. "In summation, the data seem to indicate that when hen wood ducks have a choice they prefer to nest in boxes without guards. However, when all the boxes in a given area have guards or nesting pressure is high, the predator guards used in this project do not appear to affect the usage of wood duck boxes."

Durant, A. J. (Mo. U. Sch. Vet. Med., Columbia.) IMPACTION AND PRESSURE NECROSIS IN CANADA GEESE DUE TO EATING DRY HULLED SOYBEANS. J. Wildl. Mgt. 20 (4): 399-404, 5 photos. Oct. 1956.
This condition has been observed for several years at Swan Lake Natl. Wildl. Refuge in Mo. The malady appears about Oct. 15 and ends Nov. 15, about when soybeans are harvested. Symptoms and pathology are described. The author has been able to reproduce the malady by inserting large numbers of dry soy beans into the esophagus and adding water, which causes the beans to swell. Since geese ordinarily feed only on beans that have shattered during harvest, a possible solution is to disk or plow under the shattered beans immediately after harvest. Impaction has been practically eliminated from the Refuge since these recommendations were carried out.--Author.

Dzubin, Alex. (Can. Wildl. Serv., Saskatoon, Sask.) PAIRING DISPLAY AND SPRING AND SUMMER FLIGHTS OF THE MALLARD. Blue Jay 15(1): 10-13, 1 photo. Mar. 1957.
Describes behavior during the breeding season.

Ellarson, Robert Scott. A STUDY OF THE OLD-SQUAW DUCK ON LAKE MICHIGAN. Ph.D. thesis, U. Wis. 243 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]
Annual mortality of all kinds of diving birds in gill nets on Lake Mich. was estimated at 15,539 birds in 1951-52 and 19,562 in 1952-53. Minimum cost to fishermen is 28¢ per bird. A total of 9,215 birds caught in nets was examined; 98.6% were old-squaw ducks. Fluoroscopy showed only 0.9% of old-squaws carrying body shot and no ingested shot. Juveniles can be distinguished from adults through May of the year after hatching on basis of plumage and cloacal characters. Birds do not become sexually active until 2 years of age. Other data: weights by sex, age, and season; gonadal development; plumages; and food habits. "...the amphipod, Pontoporeia affinis...is the principal food of old-squaw ducks and Great Lakes whitefish. In view of this close relationship with ducks and fish dependent on a single food item, it is doubtful if any practical means can be devised to reduce gill-net mortality."--L. F. Stickel.

Fallis, A. M., R. C. Anderson, and G. F. Bennett. (Ont. Res. Found., Toronto 5.) FURTHER OBSERVATIONS ON THE TRANSMISSION AND DEVELOPMENT OF LEUCOCYTOZOON SIMONDI. Can. J. Zool. 34(5): 389-404, 1 pl. Oct. 1956.

Geis, Mary Barraclough. (Mont. Coop. Wildl. Res. Unit, Missoula.) PRODUCTIVITY OF CANADA GEESE IN THE FLATHEAD VALLEY, MONTANA. J. Wildl. Mgt. 20(4): 409-419. Oct. 1956.
A local population of Branta canadensis was studied in 1953 and 1954. The study area was well defined and accessible and the breeding population was relatively small and stable. Under these conditions practically all nests could

be located, population composition assessed, effect of renesting considered, and gosling survival determined. Nesting studies provided data on nest sites, clutch size, hatching and nesting success, causes of nesting failure, and total production of eggs and young. Brood studies furnished data on brood movements and habits, brood grouping, and gosling mortality. 21 broods were color-marked in the egg by dye-injection and movements of these broods could be followed for 5 to 6 weeks after hatching. Productivity was estimated from the number of young that reached flying age in July. In 1953 there was a population of 800 geese, 400 of which were breeding birds. 225 nests, including 25 renests, were studied. A total of 634 young reached flying age, an av. productivity of 3.16 young per breeding pair. In 1954 there were 1,075 geese in the area, 432 of which were breeding birds. 254 nests, including 38 renests, were located. 446 young reached flying age, an av. of 2.32 young per breeding pair.--Mary B. Geis.

Goodwin, Arthur B. (Minn. Div. Game.) A STUDY OF RING-NECKED DUCK NESTING IN THE POTHOLE REGION OF MAHNOMEN COUNTY, MINN. Flicker 29(1): 22-29, 2 maps, 6 photos. Mar. 1957.

In this transition zone, wet areas are dominated by hardstem bulrush and cattail, but shallow water and shore cover are dominated by sedges. Nesting marshes, located by watching activity of female ducks, were of 3-40 acres, av. 20 acres. Nesting took place in shallow bulrush-marsh areas separated from the loafing, feeding, and brood-raising ponds by distances up to 1/4 mi. Three nests and their environments are described. Twenty-nine pairs of ducks on 5 ponds produced 17 broods of young.--L. F. Stickel.

Grenquist, Pekka. IS OUR GRAY LAG LOOSE POPULATION ON THE INCREASE? Suomen Riista 10: 87-94, 2 photos. 1956.

In Finnish. English abstract on separate mimeo. sheet. On past and present status and distribution in Finland. Greatly reduced by man's activities, the bird now has protection of a closed season and certain other advantages. Probably there are more than 200 breeding pairs today; this represents a slight increase.

Hammond, M. C., and G. E. Mann. (US F&WS, Upham, N. Dak.) WATERFOWL NESTING ISLANDS. J. Wildl. Mgt. 20(4): 345-352, 3 photos. Oct. 1956.

Certain N. Am. populations of Branta canadensis and ducks have nesting concentrations on small natural and artificial islands, where high reproductive rates frequently occur. The Lower Souris Refuge (N. Dak.) islands most valuable to both ducks and geese had these characteristics: (1) they were isolated by an open water zone which usually prevented invasion by egg-eating mammals; (2) normal summer water depths were about 12 to 18 inches, deep enough to deter predators, yet permitting good pondweed growth; (3) absence of tall, rank vegetation in the dominant vegetative cover. It does not appear that similar compensating nesting concentrations will occur on other habitat sites as the number of water bodies is reduced through the present agricultural drainage program. Costs of artificial island construction by private contractor in 1955 were estimated to equal about 20¢ per goose and 5¢ per duck produced in a 100-year period. --M. C. Hammond.

Hansen, Henry A., Charles W. McNeil, and Margaret D. Priebe. (Wash. State Game Dept.) MORTALITY OF CANADA GEESE WITH IMPACTED GULLETS IN EASTERN WASHINGTON, 1949-1954. J. Wildl. Mgt. 21(1): 96-98, 2 figs. Jan. 1957.

From 1949 through 1954, 134 Canada geese were found dead on or near Turnbull Natl. Wildl. Refuge. All had impacted gullets and were emaciated. Lead poisoning was in evidence, but not in lethal amounts. Amidostomum anseris (gizzard worms) were present and seemed to contribute to impaction and necrosis of gullet. Data are given on level of uric acid in normal blood of Canada geese.--C. W. McNeil.

Hay, Keith. (Colo. Dept. Game.) CLOSING RESERVOIRS FOR BETTER HUNTING! Colo. Outdoors 5(6): 18-20, 2 photos. Nov.-Dec. 1956.

Colo. finds that closing reservoirs to hunting results in waterfowl remaining in the area and providing better hunting in the vicinity. Birds rest on the reservoirs and forage out into crop fields. Previously, with shooting over water, they soon left the region and headed south.

Humphrey, Philip S. (U. Mich. Mus. Zool.) REMARKS ON THE COURTSHIP AND VOICE OF THE BLACK SCOTER. Condor 59(2): 139-140, 1 fig. Mar.-Apr. 1957.

Johnsgard, Paul A. (Cornell U.) EFFECTS OF WATER FLUCTUATION AND VEGETATION CHANGE ON BIRD POPULATIONS, PARTICULARLY WATERFOWL. Ecol. 37(4): 689-701, 4 figs. Oct. 1956.

Study of the Potholes area of Wash., where a reservoir has flooded many sand-dune potholes and has affected levels in others. Potholes affected in all degrees were studied. Most bird species were associated with definite types of potholes and vegetation. Flooding reduced the waterfowl population, caused redistribution of birds, and concentrated breeders into the remaining smaller potholes. Flooding also reduced the most important nesting cover. The reservoir has not yet attracted significantly greater numbers of migrant waterfowl in fall, but field-feeders such as mallards are more abundant. Scirpus americanus and Distichlis stricta were important native foods for waterfowl. Peas, corn, and wheat comprised over 3/4 of food taken by mallards. "Attempts to preserve the original wildlife and vegetation of the area would be futile under present conditions of water fluctuation. Those species which are particularly adapted to conditions found in the most advanced vegetational stages have already been seriously affected and will be the first to be extirpated from the area. Only the most adaptable species will be able to persist."

Johnsgard, Paul A., and Irven O. Buss. (Cornell U.) WATERFOWL SEX RATIOS DURING SPRING IN WASHINGTON STATE AND THEIR INTERPRETATION. J. Wildl. Mgt. 20 (4): 384-388. Oct. 1956.

During spring of 1954, sex-ratio studies were conducted in the Potholes area, Grant Co., central Wash. Data were collected on over 15,000 ducks of 17 species. Sex ratios during any 1 period varied as a result of different habitat preferences and tolerance of disturbance between paired and unpaired birds. Changes in sex ratios as the migration period progressed were interpreted as the result of differential migratory behavior between ages, sexes, and paired vs. unpaired birds.--Irven O. Buss.

Jones, N. G. Blurton. CENSUS OF BREEDING CANADA GEESE 1953. Bird Study 3: 153-170. 1956. [From notice by L. McC., Ibis 99(1).]

"A B.T.O.-aided investigation of the British breeding population of Branta canadensis, showed that in July 1953 between 2200 and 4000 adults, non-breeders and goslings were present. The birds are distributed in isolated localized groups and there is little attempt at colonization of new waters. Man appears to be the only predator of any importance, and at least one colony has been exterminated by mass egg-collecting."

Koskimies, Jukka. (Game Res. Inst., Helsinki.) JUVENILE MORTALITY AND POPULATION BALANCE IN THE VELVET SCOTER (MELANITTA FUSCA) IN MARITIME CONDITIONS. Acta XI Internat. Ornith. Congress 1954. p. 476-479. Dec. 1955.

In English. Scoters have colonized the outer islets of Finland in the past 15-25 years; their previous habitat was inland lake areas. In the maritime region, 90-95% of young die during their first 5-10 days. Factors responsible are believed to be: tendency to overcrowding in brood-rearing areas, extremely loose parent-young bonds, and sensitivity to bad weather. The author believes the population is maintained by influx from some other area.--L. F. Stickel.

Koskimies, Jukka. DISTRIBUTION OF HUNTING MORTALITY OF FINNISH MALLARDS. Suomen Riista 10: 18-25, 2 maps, 2 graphs. 1956.

In Finnish. English abstract on separate mimeo. sheet. From abstract: Mallards born in Finland remain near place of birth until Nov., when they disperse. Of 133 young mallards marked in Finland, 27% were shot near where marked. In all, 38% of marked birds were shot within Finland. Total bag of first year birds outside Finland exceeded Finnish bag by about 25%. Overall, 60% of the mallard population originating in Finland is shot outside the country.

Koskimies, Jukka. THE AGE OF THE MALLARD. Suomen Riista 10: 102-104. 1956.

In Finnish. English abstract on separate, mimeo. sheet. Complete abstract: "The mortality of 133 Finnish mallards marked when young was 57% by December 31 of their first year of life and in the following calendar years an average of 56%. After the turn of the first year the mortality remained roughly constant.

The highest established individual age was 6 years 4 months. Over a half (57%) of the young birds died at the age of less than 6 months and only 17% survived for 1-1/2 years. At the time of marking the average life expectation of the young was about 7 months, that of young birds past the December 31 of their first year of life about 1 year 3 months. According to this material, the turnover period of the Finnish mallard population is about 6 years."

Larionov, V. F. CHANGES IN THE TERM OF BREEDING SEASON IN THE MALLARD. Zool. Zh. 31: 89-95. 1956. [From abstract by F. J. T., Ibis 99(2).]
In Russian with English summary. "From the dates of the arrival of Mallards in areas at different latitudes and from other information, the author concludes that the interval between arrival and the beginning of breeding diminishes from south to north. The reasons for this are discussed."

Lauckhart, J. Burton. (Wash. Game Dept.) CALCULATING MORTALITY RATES FOR WATERFOWL. Murrelet 37(3): 31-34. Sept.-Dec. 1956.
Survival rates of mallard ducks banded at Yakima, Wash. showed a 57% annual loss, with 26.7% attributable to hunting. In contrast, mallards banded in Skagit Co., Wash. showed 78.6% annual loss, 66.5% for the hunting season. The nonhunting-season mortality in the latter area was thus calculated at 12.1%. The author concludes that hunter harvest can replace much of the natural loss of a waterfowl population, but adds that "There must be a minimum to which natural loss may be reduced and it would seem that 12% may be near to this minimum point." The survival tables are based on pooled data of birds banded 1947-1954; hunting-season mortality is derived from returns of birds banded before the hunting season in contrast to returns from birds banded after the hunting season. Methods of making the estimates are given in direct form, without discussion of statistical problems or calculation of statistical variation.--L. F. Stickel.

Lebret, T. (Park de Griffioen 17, Middelburg, Netherlands.) ARE GROUP SIZE COUNTS OF WILD GEESE AN INDEX OF PRODUCTIVITY? Ardea 44(4): 284-288. 1956.
Author's conclusion: "1. In wild geese small groups are not necessarily identical to families, 'pseudo-families' being a regular phenomenon. 2. Group size counts therefore cannot be used as an index for productivity or shooting pressure. 3. Only true family counts can be used for this purpose. 4. Counts of this type can only be collected in those species where juveniles can easily be distinguished in flight."

Lee, Forrest B. (Minn. Dept. Cons.) THE RECORD OF MINNESOTA DUCK CRIPPLING. Cons. Volunteer 20(114): 51. Nov.-Dec. 1956.
Data for the years 1949-55 show cripple losses of 12.7% to 21.8%. In 1953 these losses were 16.5% for hunters who used dogs and 25% for those who did not.

Lensink, Calvin J. (Purdue U.) USE OF A GILL NET IN TRAPPING WATERFOWL. J. Wildl. Mgt. 21(1): 103-104. Jan. 1957.
Tells how gill nets of 6-in. mesh, 100-200 ft. long, can be used in banding ducks. Nets are suspended at strategic sites in such a way that they are partly above water, partly below. Flightless waterfowl are then herded into nets and captured.

Monson, Melvin A. (US F&WS, Anchorage, Alaska.) NESTING OF TRUMPETER SWAN IN THE LOWER COPPER RIVER BASIN, ALASKA. Condor 58(6): 444-445. Nov.-Dec. 1956.

Newberne, James W. (Pitman-Moore Co., Indianapolis, Ind.) STUDIES ON THE HISTOPATHOLOGY OF LEUCOCYTOZOON SIMONDI INFECTION. Am. J. Vet. Res. 18(66): 191-199, 14 photos. Jan. 1957.

Quortrup, Erling R., M. E. Goetz, J. W. Dunsing, and Merton N. Rosen. (San Diego Co. Livestock Dept.) STUDIES ON THE INCIDENCE OF POULTRY DISEASES IN WILD DUCKS. Calif. Fish & Game 43(2): 139-141. Apr. 1957.

Ramsay, A. Ogden. (McDonogh, Md.) SEASONAL PATTERNS IN THE EPIGAMIC DISPLAYS OF SOME SURFACE-FEEDING DUCKS. Wilson Bul. 68(4): 275-281, 1 graph. Dec. 1956.

Riggs, Carl D. (U. Okla.) HEIGHT OF A FLOCK OF MIGRATING DUCKS. Auk 73(4): 556. Oct. 1956.
Scaups, genus Aythya, sighted at 5,700 ft. on Oct. 15, 1952.

Schierbaum, Donald L., and Donald D. Foley. (N. Y. Cons. Dept.) DIFFERENTIAL AGE AND SEX VULNERABILITY OF THE BLACK DUCK TO GUNNING. N. Y. Fish & Game J. 4(1): 88-91. Jan. 1957.
Author's abstract: "Data are given for the sex and age of 455 black ducks taken by gunning from a total of 6,641 banded during late summer and early fall from 1952 to 1954, and for 1,286 black ducks examined during hunter bag checks in the same years. Analysis indicates that males may be somewhat more vulnerable than females to gunning before they have been subjected to appreciable hunting pressure; also, that juveniles generally are more vulnerable than adults."

Steel, Paul E., Paul D. Dalke, and Elwood G. Bizeau. (US F&WS, Othello, Wash.) CANADA GOOSE PRODUCTION AT GRAY'S LAKE, IDAHO, 1949-1951. J. Wildl. Mgt. 21(1): 38-41, 1 fig. Jan. 1957.
On this 22,000-acre lake in se. Idaho, Canada geese began nesting before the marsh was free of ice and snow. 77% of all goose nests were on muskrat houses; 4/5 were built on cattail, bulrush, or a combination of these cover types. Of 361 goose nests, 80% were successful. Land nests and marsh nests were equally successful. 15% of all terminated nests were deserted for unknown reasons. Av. clutch size for the 3 years was 5.2. Following spring censuses of about 800 and 1,000 breeding and nonbreeding geese in 2 different years, the calculated hatch amounted to 990 and 1,010 goslings.--Authors.

Teplov, V. P., and N. N. Kartashev. SCIENTIFIC FOUNDATIONS OF THE REGULATING OF WATERFOWL GAME IN THE CENTRAL REGIONS OF THE EUROPEAN PART OF THE USSR. Zool. Zh. 35: 77-88. 1956. [From abstract by F. J. T., Ibis 99(2).]
In Russian with English summary. "A study based on field observations, game statistics, ringing records, stomach and moulting analysis of the waterfowl, mostly ducks, in and around the Oka State Game Preserve. The purpose of the study was to find out the hunting pressure, distribution of bags in time and space, species composition and age, for the planning of game management. The authors conclude that the evaluation of ringing data is unreliable at present, as the ringing is biased in many ways and the number of ducks marked too few (only about 10,000 yearly), and the recoveries are unsatisfactory. The authors suggest that the open season for waterfowl should be shortened, sanctuaries established and large-scale ringing undertaken."

Weller, Milton Webster. PARASITIC EGG LAYING IN THE REDHEAD (AYTHYA AMERICANA) AND OTHER NORTH AMERICAN ANATIDAE. Ph.D. thesis, U. Mo. 173 p. 1956. [From long abstract in Dissertation Abstracts 16(1).]
One-third of the redhead females were completely parasitic, 50-60% laid parasitically and later made nests of their own, and approximately 10% nested normally. Both yearling and adult females laid parasitically. Average number of parasitic eggs laid by each female was 11. As many as 13 females were trapped on one nest. More than half the parasitic eggs were deposited after the host started incubation and thus were destined not to hatch. "Continued parasitic intrusion seldom caused nest desertion in canvasbacks or mallards but redhead females commonly abandoned their nests because they were much less broody. Parasitism reduced clutch size of the host by twenty percent and reduced both egg and nest success when it was severe. Of all hosts, the canvasback suffers most...because the breeding range and nesting habitat of the two species are identical... As a result of the redhead's parasitic habits and weakened maternal instincts, the balance between natality and mortality are so close that the size of the redhead population must be closely watched. Where possible, its nesting habitat should be managed to prevent nest losses from flooding."--L. F. Stickel.

Weller, Milton W. (U. Mo.) GROWTH, WEIGHTS, AND PLUMAGES OF THE REDHEAD, AYTHYA AMERICANA. Wilson Bul. 69(1): 5-38, 20 figs. + 1 col. pl. Mar. 1957.
From author's summary: Data were obtained from captive and wild birds. Detailed data are presented on growth and sequence of plumages of young ducks, and weight changes and sequence of molts and plumages of adults. Cumulative curves of growth in weight of embryos and juveniles showed typical sigmoid form.

There was a decline in weight during remige formation. Males were heavier than females by the second week of life and remained so. Growth of culmen and tarsus showed steadier progression than did weight. In fall, adult males were heaviest, adult females and immature males were similar in weight, and immature females were lightest. Birds of both sexes lost weight during migration and molt. Females lost during laying and incubation. A diagram of feather development at weekly intervals is presented as an aid in aging juveniles in the field. Ability to fly was attained at 8.5 to 9 weeks. Sequence of molt was different in the two sexes. Some features of plumages of hybrids with canvasback and with ring-necked duck are described.--L. F. Stickel.

Wisely, B., and K. H. Miers. (Canterbury U., Christchurch, N. Z.) LEAD POISONING IN NEW ZEALAND WATERFOWL. N. Z. Dept. Int. Affairs, Wildl. Publ. no. 41. 1-11 p., 2 figs. 1956.
Reports first authenticated cases from N. Z. (in black swan and 2 species of Anas) and gives good, brief review of published Am. work on lead poisoning.

Yeager, Lee E., and Harold M. Swope. (US F&WS, Colo. State U.) WATERFOWL PRODUCTION DURING WET AND DRY YEARS IN NORTH-CENTRAL COLORADO. J. Wildl. Mgt. 20(4): 442-446. Oct. 1956.
Waterfowl production was studied on 20 marshes, ponds, and lakes and 4 stream sections during peak of precipitation cycle (1949) and during near-record drouth (1955). Suitable nesting habitat showed a reduction of 61.8% (1,310 acres vs. 500) and production a decline of 75.2% (141 young vs. 35). Much of the shallow marsh type was drained prior to 1955 and is now permanently lost to waterfowl production. Mallards constituted about 75% of the breeding population. In wet years, production lost by flooding along streams appears to be compensated for by relatively high nesting success around marshes and ponds. During years of low rainfall, the versatile mallard finds fair-to-good nesting ground in unflooded riverbottoms. Waterfowl production for the Cache la Poudre Valley as a whole--about 343 sq. mi. of riverbottom and irrigated farmland--was thus only 44.4% rather than 75% lower in 1955 than during years when average water levels prevailed.--Lee E. Yeager.

CRANES, RAILS, SHOREBIRDS

Glasgow, Leslie L. (La. State U.) A WOODCOCK SEXING TOOL. J. Wildl. Mgt. 21(1): 104, 1 fig. Jan. 1957.
American woodcock can be sexed accurately (2.6% error in 115 birds) with a small plastic tool that is used to measure beak length. Details of construction and use are described.--Author.

Gullion, Gordon W. (Nev. Game Comm., Austin.) AN OBSERVATION CONCERNING THE VALIDITY OF COOT BROOD COUNTS. J. Wildl. Mgt. 20(4): 465-466. Oct. 1956.
A note of caution is given concerning evaluation of nesting success and brood survival from counts of young coot broods. Data are presented to show that counts of broods that are less than 3 weeks old may represent less than 70% of actual surviving young.--Author.

Hardy, John Wm. THE LEAST TERN IN THE MISSISSIPPI VALLEY. Mich. State U., Publ. of Mus., Biol. Ser. 1(1): 1-60, 14 figs. + 4 pl. Mar. 1957.
A field study of a colony at Bell Is., Ill. in the Ohio River was made June-Sept. 1953; additional data were obtained from correspondence and literature. Topics include: distribution and migration, nesting habitat needs and preferences, colony size, feeding behavior, mortality factors, breeding season (breeding cycles of nearly all terns in a colony were synchronized by flood conditions), nest construction, description of eggs, clutch size, incubation period, growth and development of young, behavior during courtship, incubation, and care of young.--L. F. Stickel.

Hinde, R. A., W. H. Thorpe, and M. A. Vince. THE FOLLOWING RESPONSE OF YOUNG COOTS & MOORHENS. Behaviour 9: 214-243. 1956. [From abstract by K. E. L. S., Ibis 99(2).]

Liscinsky, Stephen A. (Pa. Game Comm.) A STUDY OF THE EFFECTS OF HABITAT QUALITY AND HUNTING ON PENNSYLVANIA WOODCOCK. Proc. NE. Sec. Wildl. Soc. et al. 1-9 p., mimeo. Jan. 1957.

Summary and recommendations: "It is generally recognized that habitat deficiencies and hunting are the major limiting factors controlling woodcock populations. Corrective measures for the major habitat inadequacies in Pennsylvania have been suggested. It was pointed out how excessive gunning can affect resident woodcock populations. It now remains in our research to elaborate on these experiments and to apply the findings to other areas." The following steps should be taken: 1. Habitat improvement tests should be continued and expanded. 2. Studies should be made to test further the effect of gunning pressure, as by closing certain areas thought to be shot-out. 3. Regulations should be adjusted to protect native breeding stock. 4. Basic woodcock studies such as those now directed by Sheldon, Glasgow, Mendall and others should be expanded and new aspects of biology explored.

Rosen, Merton N., Erling R. Quortrup, M. E. Goetz, and J. W. Dunsing. (Calif. Dept. Fish & Game.) STUDIES ON THE INCIDENCE OF POULTRY DISEASES IN COOTS. Calif. Fish & Game 43(2): 143-146. Apr. 1957.

Sheldon, Wm. G. (U. Mass.) ANNUAL SURVIVAL OF MASSACHUSETTS MALE WOODCOCKS. J. Wildl. Mgt. 20(4): 420-427. Oct. 1956.

Survival of male woodcocks was studied for 5 years by trapping breeding males each spring. Data on 131 return records are presented. Analysis of homing of male birds and trapping efficiency suggested that traps captured between 50 and 60% of the breeding males present. Because of a drop in population owing to vegetational changes, estimations of survival were based on only 43 birds banded in 1950 and 124 birds banded in 1951. These data suggested a minimum annual survival of 57% of male woodcocks and indicated an annual mortality of 43% of adults and 69% of juvenals.--Author.

Sheldon, Wm. G. (U. Mass.) PRELIMINARY RESULTS AND TECHNIQUES OF MASSACHUSETTS SUMMER WOODCOCK STUDIES. Proc. NE. Sec. Wildl. Soc. et al. 1-11 p., proc. Jan. 1957.

Discusses summer netting areas, pattern of flights, weights, age and sex ratios, and possible methods of ascertaining ages of bagged birds. "In summary, the possible applications of these findings to management of woodcocks are as follows: 1. Open fields frequented by woodcocks during summer to feed on insects may well be an integral part of woodcock habitat. It is probable that any breeding habitat contains such fields since in all the summer areas observed, the same openings were used as singing grounds in the spring. Several singing grounds on roads or very small openings would not be suitable as summer feeding grounds. 2. By further molt and head study, it is hoped to develop a technique to separate age classes of woodcocks by wing or head examination in the fall. Although the bursa technique is valid, it is difficult to examine any quantity of specimens in one season. If ageing by examination of wings is possible, it would be relatively simple to collect good samples in all the breeding areas. Such a sample would serve as a valid index to check our present inventory technique. 3. In the local netting areas in the vicinity of Amherst, sufficient summer samples should be netted to give a hen-chick ratio which will serve as an index of annual productivity. This will be checked against the local inventory each spring as a further test of inventory technique..."

Tanner, Ward D., Jr., and George O. Hendrickson. (Iowa State Coll.) ECOLOGY OF THE SORA IN CLAY COUNTY, IOWA. Iowa Bird Life 26(4): 78-81. Dec. 1956.

"In summary, on Dewey's Pasture Public Shooting Ground of 402 acres with 28 small marshes, Clay County, Iowa, 15 adult and 114 juvenile Soras were banded and released, 1951 and 1952. The earliest arrival date was April 30, 1951, and the latest sight record September 27, 1952. Spring migrants, 1951, arrived largely May 1-7 and on May 10. On 107 acres of cover searched, 35 occupied nests were in lake sedge and river bulrush, primarily. Of 228 eggs in 26 nests, 1951, 126 hatched June 1-26. In 24 complete clutches of both years were 241 eggs, about 10 in a clutch. The estimated time of incubation in four nests was 19 days, and in a fifth 20 days. A probable 135 young hatched from 15 successful nests, 1951, about 1.7 per acre on 81.4 acres of suitable cover."

U. S. Fish & Wildlife Service and Canadian Wildlife Service. INVESTIGATIONS OF WOODCOCK, SNIPE, AND RAILS IN 1956. US F&WS, Spec. Sci. Rep.: Wildl. no. 34. ii + 85 p., maps & graphs. Jan. 1957.

Twelve reports on current surveys and studies: Perspective of Woodcock, Snipe and Rail Investigations - 1956, by John W. Aldrich. The Wintering Woodcock Population on Nocturnal Feeding Sites in Louisiana in 1955-56, by Leslie L. Glasgow. Wintering Woodcock Observations in West-Central Louisiana 1955-56, by Vincent H. Reid and Phil Goodrum. Woodcock Singing Ground Counts in Canada - 1956, by V. E. F. Solman. Woodcock Census Studies in Northeastern United States - 1956, by Howard L. Mendall. Woodcock Singing Ground Counts for the Middle Atlantic States for 1956, by Ward Sharp. Woodcock Breeding Ground Counts in the Central-Northern United States 1956, by John W. Aldrich. Massachusetts Woodcock Studies, by William G. Sheldon. Preliminary Analysis of Woodcock Band Returns, by Leslie L. Glasgow. Wilson's Snipe Wintering Ground Studies, 1955-56, by Chandler S. Robbins. On the Breeding of Wilson's Snipe in Newfoundland, by Leslie M. Tuck. Clapper Rail Study, by Fred Ferrigno.

OTHER BIRDS

Lack, David. SWIFTS IN A TOWER. Methuen & Co., London. 239 p., 19 pls. 1956. 21s. [From review by Landsborough Thomson, Nature 179(4552).]

A compact book written in nontechnical language, rigorously scientific, full of original observations and critical appraisals of earlier publications. British swifts were studied directly, for years, in a tower equipped with nest boxes and glass panels for observation. "It must suffice to say that there are chapters dealing with the fight for homes, with courtship, with nest building, with laying and incubation, and with the nestlings in their naked and feathered stages. Other chapters deal with the swift at large--its feeding habits, its flight and its migration. Then there is a statistical chapter on the birth-rate of swifts; and finally a philosophical chapter on the meaning of adaptation, a theme for which the extreme specialization of the swift provides an appropriate basis."

Linsdale, Jean M. (Hastings Nat. Hist. Reserv., Carmel Valley, Calif.) GOLDFINCHES ON THE HASTINGS NATURAL HISTORY RESERVATION. Am. Midl. Nat. 57(1): 1-119, 14 figs. Jan. 1957.

Life history and ecological observations of green-backed goldfinch and Lawrence goldfinch. Observational data were recorded by 35 collaborators from 1937 to 1955. No birds were trapped or killed. Data are organized under the various aspects of life history and ecology; many details of observation are included. Principle topics are: distribution and abundance, habitat preferences, water needs, escape cover, flocking behavior, mating and courtship behavior, nesting season, nest construction, brooding and rearing behavior, foraging activity, food habits, salt eating, and relationships with other species.--L. F. Stickel.

Marshall, A. J., and D. L. Serventy. (St. Bartholomew's Med. Coll., U. London, Eng.) THE BREEDING CYCLE OF THE SHORT-TAILED SHEARWATER, PUFFINUS TENUIROSTRIS (TEMMINCK), IN RELATION TO TRANS-EQUATORIAL MIGRATION AND ITS ENVIRONMENT. Proc. Zool. Soc. London 127(4): 489-510, 2 pls., 3 figs. Dec. 1956.

Important study of a most remarkable bird, which in U. S. is called "slender-billed shearwater." The paper discusses natural history, migration, factors affecting migration and reproduction, and the physiology and histology of reproduction.

Neff, Johnson A., and Brooke Meanley. (US F&WS, Denver 2, Colo.) STATUS OF BREWER'S BLACKBIRD ON THE GRAND PRAIRIE OF EASTERN ARKANSAS. Wilson Bul. 69(1): 102-105. Mar. 1957.

Arrival and departure dates, behavior in relation to grain crops, food habits, roosting. The species is considered beneficial to agriculture of the area.

Nelson, Morlan W. (Soil Cons. Serv., Boise, Idaho.) HAWKS AND EAGLES IN CONSERVATION. Soil Cons. 22(9): 204-208, 6 photos. Apr. 1957.

This general, popular article includes some interesting and unusual first-hand observations of ways in which game birds and other animals avoid predation by hawks.

Nolan, Val, Jr. (R. R. 10, N. Fee Lane Bloomington, Ind.) SPITTLE INSECTS AS FOOD OF PRAIRIE WARBLERS. Auk 73(4): 557. Oct. 1956.

Cercopid larvae have been considered protected by their masses of foam, but the author found that prairie warblers systematically probed into the masses for them.

Orians, Gordon, and Frank Kuhlman. (U. Wis.) RED-TAILED HAWK AND HORNED OWL POPULATIONS IN WISCONSIN. Condor 58(5): 371-385, 6 figs. Sept.-Oct. 1956.

These birds were studied on a 95-sq. mi. area for 3 years. All resident birds and all nests of both spp. were located. "Red-tailed Hawks hunted singly or in groups throughout the winter but were paired on territories by the end of February. There were 27 nests in 1953, 33 in 1954, and 27 in 1955. Nests were built as early as the end of January but eggs were never laid before March. Nesting success was 1.8 young per nest in 1953, 1.1 young per nest in 1954, and 1.4 young per nest in 1955. The causes of nest failure could not be determined. Horned owls did not build their own nests but used old nests of hawks (35), crows (3), herons (1), squirrels (2). There were 13 nests in 1953, 17 in 1954, and 11 in 1955. All pairs on our area moved into their nesting area by early January and the first eggs were laid by the end of the month. Nesting success was 1.1 young per nest in 1953, 1.9 young per nest in 1954, and 1.3 young per nest in 1955. Thirty-one of the 48 Horned Owl nests we found were in old Red-tailed Hawk nests, and we feel that Red-tails greatly aid the owls by providing a large number of excellent nests. Pheasants and cottontails were the principal foods of both the Red-tailed Hawks and Horned Owls in the breeding season, and the two predator species may compete for food. They sometimes competed for nests. They may occasionally prey directly upon each other's young."

Rawls, Charles K., Jr. (Tenn. Dept. Cons.) FISHERMAN WITHOUT A LICENSE. Tenn. Cons. 22(11): 12-14. Nov. 1956.

Double-crested cormorants at Reelfoot Lake, Tenn., feed mainly on rough fish, particularly gizzard shad, and thereby do more good than harm.

Rechnitzer, Andreas B. (Scripps Inst. Oceanog., La Jolla, Calif.) FORAGING HABITS AND LOCAL MOVEMENTS OF THE WOOD IBIS IN SAN DIEGO COUNTY, CALIFORNIA. Condor 58(6): 427-432, 1 map. Nov.-Dec. 1956.

Roest, A. I. (Calif. State Polytechnic Coll.) NOTES ON THE AMERICAN SPARROW HAWK. Auk 74(1): 1-19, 1 graph. Jan. 1957.

Prenesting behavior, nesting and incubation, eggs, food storing, development of young, weights of young and adults, care of young, migration, molting and plumages, hunting and feeding, behavior of captives, relations with other birds, causes of mortality, life expectancy in wild, longevity in captivity, and sex ratios.

Sauter, U. BEITRÄGE ZUR ÖKOLOGIE DER SCHLEIEREULE (TYTO ALBA) NACH DEN RINGFUNDEN. Vogelwarte 18: 109-151. 1956. [From notice by D. W. S., Ibis 99 (1).]

"A detailed analysis of the recovery of about 1400 German and other European Barn Owls. Distant recoveries were proportionately more numerous in some years (especially 1937-38, 1947-48, and 1952-53) than in others; but there was no sharp division between different years in this respect. Mortality was higher in some winters than others, and was apparently connected with hard weather (and possibly also with the abundance of food). Breeding productivity was correlated with the food supply. Young Barn Owls disperse in all directions. There is no evidence of true return to the birth place. They seem to settle in the place to which they wander in the course of their first winter. The females, at least, may breed in their first year."

Shaub, Mary S. (159 Elm St., Northampton, Mass.) EFFECT OF NATIVE FOODS ON EVENING GROSBEAK INCURSIONS. Bul. Mass. Aud. Soc. 40(9): 481-488, 2 figs. Dec. 1956.

OTHER BIRDS--Continued

Sprunt, Alexander, Jr. THE CATTLE EGRET IN NORTH AMERICA--1956. Aud. Mag. 58(6): 274-277, map. Nov.-Dec. 1956.
Spread was explosive. The bird has appeared from Fla. and Texas to Me. and Ont. Breeding has been demonstrated in Fla., La., S. C., and N. C. Nests in Lake Okeechobee totaled about 1,100, with av. of 3 per nest brought to flying age. Cattle egrets are not highly pugnacious, but they easily hold their own with native herons.

Stegeman, LeRoy C. (State U. of N. Y., Syracuse.) WINTER FOOD OF THE SHORT-EARED OWL IN CENTRAL NEW YORK. Am. Midl. Nat. 57(1): 120-124, 2 figs. Jan. 1957.
Pellets were collected in 1953 and 1954 from the roosting area of a group of 7-14 owls. The area was a 10-acre park containing spruce and cedar and surrounded by a few houses beyond which were open, abandoned fields. Meadow mice occurred 1300 times in the pellets, all other species 37 times. Sex ratio of Microtus, shown by pelvic girdle, was 405 males to 370 females; 284 were too badly broken for determination, but probably contained more females because of the more fragile girdle. 200 pellets, taken in Feb. and Mar. and especially examined to determine mouse ages, showed 86.5% young mice.--L. F. Stickel.

Stimson, Louis A. (P. O. Box 3303, Miami 21, Fla.) THE CAPE SABLE SEASIDE SPARROW: ITS FORMER AND PRESENT DISTRIBUTION. Auk 73(4): 489-502, 1 map. Oct. 1956.
Good study of status and history of this rare and local bird, which for a time was considered extinct. Range and habitat are less restricted than usually supposed.

Sulkava, Seppo. THE NESTING-TIME FOOD OF THE GOSHAWK. Suomen Riista 10: 44-62, 4 photos. 1956.
In Finnish. Long English abstract on separate mimeo. sheet. Woodland birds were main food. Game made up 86% of diet in spring and 43% in summer. Birds of hazelgrouse size seemed to be preferred. "It is obvious that a large population of the goshawk limits bird populations considerably, especially woodland birds."

Summers-Smith, D. MOVEMENTS OF HOUSE SPARROWS. Brit. Birds 49(12): 465-488. Dec. 1956.
Important study of Passer domesticus. It takes up sedentariness, migrations in various regions, roosting and feeding movements, homing, travels in range extensions, and regional variations.

Sutton, George Miksch, and David F. Parmelee. (U. Okla.) THE ROUGH-LEGGED HAWK IN THE AMERICAN ARCTIC. Arctic 9(3): 202-207, 2 photos. 1956.
Notes on nesting, range, foods, coloration, etc. Based mainly on work on Baffin Is., 1953.

Various authors. THE RARER BIRDS OF PREY / THEIR PRESENT STATUS IN THE BRITISH ISLES. Brit. Birds 50(4): 129-155. Apr. 1957.
Authoritative articles of various length on recent history, present status, and population factors of golden eagle, goshawk, kite, honey buzzard, marsh harrier, hen harrier, Montagu's harrier, osprey, hobby, and peregrine. Some of these species are increasing but are subjected to much persecution.

REPTILES AND AMPHIBIANS

Brown, E. E. (Davidson Coll.) FREQUENCY OF SKIN SHEDDING IN THE NORTHERN BANDED WATER SNAKE. Herpetologica 12(4): 313-320. Dec. 1956.
Includes review of literature on shedding by snakes.

Cagle, Fred R. (Tulane U.) AN OUTLINE FOR THE STUDY OF AN AMPHIBIAN LIFE HISTORY. Tulane Studies in Zool. 4(3): 79-110. Oct. 1956.
A detailed, copiously annotated outline designed to suggest the ideal requirements in an investigation of the life history of an amphibian. Eight-page bibliography.

Cain, A. J., and J. C. J. Galbraith. (Oxford U., Eng.) BIRDS OF THE SOLOMON ISLANDS. Ibis 99(1): 126-130. Jan. 1957.

A herpetological note in this paper should be brought to attention: "In the Solomons the Mexican Toad Bufo marinus, introduced to check insect pests on the plantations, has itself become a pest at Honiara, Pawa and elsewhere, and has already penetrated into the closed Betilonga basin. It is said that indigenous predators (snakes, and the Water Monitor) attack it and are poisoned, and that they are dying out in the path of its advance."

Carpenter, Charles C. (U. Okla.) BODY TEMPERATURES OF THREE SPECIES OF THAMNOPHIS. Ecol. 47(4): 732-735, 4 figs. Oct. 1956.

Field study of gartersnakes (sirtalis, sauritus, butleri) in Mich. revealed thermoregulation through behavior. Mean cloacal temperatures were around 26°C. These temperatures were more closely correlated with temperatures at the ground surface than with those of air or soil.

Carr, Archie, and David K. Caldwell. (U. Fla.) THE ECOLOGY AND MIGRATIONS OF SEA TURTLES, 1. RESULTS OF FIELD WORK IN FLORIDA, 1955. Am. Mus. Novitates no. 1793. p. 1-23, 4 figs. Oct. 1956.

On green turtle, Chelonia mydas, and ridley, Lepidochelys kempi, on w. Fla. coast. Subjects treated include: marking methods, recoveries, homing and/or migration, length-width and length-weight relationships, other variation that may be of population significance, approximate estimates of sizes of local populations, and first report of a ridley with eggs.

Conant, Roger. (Phil. Zool. Soc., Phila. 4, Pa.) [PROTECTION OF REPTILES AND AMPHIBIANS BY STATES.] Copeia 1956(4): 273-274. Jan. 1957.

Acting for the Conservation Committee of the Am. Soc. Ichth. & Herp., Conant wrote all state and territorial governments of the U. S. for information on protection given any reptiles and amphibians by law or regulation. Results are summarized here.

Cowles, Raymond B. (U. Calif., Los Angeles.) SIDEWINDING LOCOMOTION IN SNAKES. Copeia 1956(4): 211-214. Jan. 1957.

Various kinds of snakes can sidewind, at least on occasion. Function of sidewinding seems to be for speed over wide open and often overheated spaces. Any special value for locomotion on loose sand is questioned.

Davis, Claude S. THE INJECTION OF LATEX SOLUTION AS A FISH MARKING TECHNIQUE. Investigations of Ind. Lakes & Streams 4: 111-116. Oct. 1955. [From long abstract by author in Sport Fishery Abstracts 2(1).]

Might have value in marking amphibians. Drops of colored latex were injected beneath skin. Latex was the best of the agents tried.

Eaton, Theodore H., Jr. (E. Car. Coll., Greenville, N. C.) LARVAE OF SOME APPALACHIAN PLETHODONTID SALAMANDERS. Herpetologica 12(4): 303-311. Dec. 1956.

Descriptions and identification aids for several species.

Fitch, Henry S. (U. Kans.) EARLY SEXUAL MATURITY AND LONGEVITY UNDER NATURAL CONDITIONS IN THE GREAT PLAINS NARROW-MOUTHED FROG. Herpetologica 12(4): 281-282. Dec. 1956.

Goin, Coleman J. (U. Fla.) DESCRIPTION OF A NEW SALAMANDER OF THE GENUS SIREN FROM THE RIO GRANDE. Herpetologica 13(1): 37-42. Mar. 1957.

Includes key to and range statements for all living forms of Sirenidae.

Gorman, Joe. (St. Louis (Mo.) U.) REPRODUCTION IN PLETHODONT SALAMANDERS OF THE GENUS HYDROMANTES. Herpetologica 12(4): 249-259, 5 figs. Dec. 1956.

Gosner, Kenneth L., and Irving H. Black. (Newark Mus., 43 Washington St., Newark 1, N. J.) LARVAL DEVELOPMENT IN NEW JERSEY HYLIDAE. Copeia 1957(1): 31-36, 4 figs. Apr. 1957.

Includes keys.

Grant, Chapman. (Rt. 1, Box 80, Escondido, Calif.) OUR VANISHING SEA TURTLES. Sci. Monthly 83(5): 257-258. Nov. 1956.
"Uniform legislation and an awakened sense of the interest-value of these creatures is all that can save the remnant from extinction." Protective state regulations vary: Ga. and S. C. give total protection; Va., N. C., Ala., Miss., and La. give none. Others are between. Legislation should be realistic in not requiring recognition of sex or species. Capture on beaches should be illegal and severely penalized. Turtles over or under certain sizes should be protected rigidly. All turtle catchers should be licensed. Gear and location of gear should be regulated. There should be a closed season to coincide with the laying season. But protection is not enough. Three possible propagative aids are discussed: establishment of reserve areas, collecting hatchlings and placing them in protected areas, and collecting eggs and starting young in supervised localities. Protected areas might be near lighthouses, Coast Guard stations or other places where control would be economical. Suitable lagoons could be screened off for holding hatchlings for a year before releasing them into ocean, where mortality of hatchlings is high.

Gunning, Gerald E., and Wm. M. Lewis. (S. Ill. U.) AN ELECTRICAL SHOCKER FOR THE COLLECTION OF AMPHIBIANS AND REPTILES IN THE AQUATIC ENVIRONMENT. Copeia 1957(1): 52. Apr. 1957.
Amphibians and reptiles are stunned by standard fish shocker, but they usually sink to bottom. Thus clear, shallow water is most suitable for the method. Reptiles recover from shocking; recovery of amphibians is not discussed.

Harrisson, Tom. (Sarawak Mus., Kuching, Brit. Borneo.) TAGGING GREEN TURTLES, 1951-56. Nature 178(4548): 1479. Dec. 29, 1956.
Reports success with polished, monometal, hard-steel, cow-ear type tags locked through inner rear trailing edge of forward flipper. Some results are mentioned. Apparently an effective program for conservation of this marine turtle is practiced in Sarawak.

Hedrick, Robert M., and John C. Holmes. (Rice Inst.) ADDITIONAL MINNESOTA HERPETOLOGICAL NOTES. Flicker 28(3): 123-126. Sept. 1956.
New or noteworthy locality records for Minn. amphibians and reptiles and a few notes on natural history.

Hunt, Timothy J. (Zool. Soc. London, Regent's Park, London, N. W. 1, Eng.) NOTES ON DISEASES AND MORTALITY IN TESTUDINES. Herpetologica 13(1): 19-23. Mar. 1957.
Discussion of ailments and injuries of turtles. Based on more than 200 autopsies and published literature.

Hutchison, Victor H. (Duke U.) NOTES ON THE PLETHODONTID SALAMANDERS, EURYCEA LUCIFUGA (RAFINESQUE) AND EURYCEA LONGICAUDA LONGICAUDA (GREEN). Natl. Speleological Soc. (1108 W. State St., Trenton 8, N. J.), Occ. Pap. no 3. 1-24 p., 8 figs. Nov. 1956. 40¢.
Distribution, size, growth, local variation, observations on life history and habits, evidence that the 2 spp. are distinct and do not intergrade.

Judd, W. W. (U. Western Ont., London.) THE FOOD OF JEFFERSON'S SALAMANDER, AMBYSTOMA JEFFERSONIANUM, IN RONDEAU PARK, ONTARIO. Ecol. 38(1): 77-81. Jan. 1957.

Kaplan, Harold M., and Richard Taylor. (S. Ill. U.) ANESTHESIA IN TURTLES. Herpetologica 13(1): 43-45. Mar. 1957.
"Ether, nembutal and urethane can all produce 'surgical' anesthesia in turtles. Urethane is the least satisfactory. The effective dosages, time to achieve anesthesia, duration of anesthesia, and other pertinent data, are reported for the three anesthetic agents."

Kauffeld, Carl. SNAKES AND SNAKE HUNTING. Hanover House, Garden City, N. Y. 266 p., 14 photos. 1957. $3.95.
Kauffeld, curator of reptiles at the Staten Is. Zoo, is an enthusiastic hunter who has never shot an animal. His big game animals are the larger rattlers, and in finding them and capturing them unharmed he has developed

amazing skill. He can make a fighting-mad diamondback crawl backward into a collecting bag. Trip after trip to Ariz., Fla., S. C., the pine barrens of N. J., and many snake dens of the NE. have given him experience unequalled by many herpetologists. Basically, the book is a popular, anecdotal account of the author's collecting, but is is a good bit more than this, for one learns much about the habitats and about many kinds of snakes, harmless as well as venomous. There are few herpetologists who will not pick up interesting information about the character of e. snake dens, the ecology of the larger snakes in relation to managed quail preserves, and the habitat preferences of various species. The book is easy, interesting reading. It is accurate and it is not in the least sensationalized. The very nature of the material, however, may lead uninformed persons to think that snakes are much more abundant than they are, for the author inevitably dwells mainly on successful hunts and time between catches is telescoped. One wonders what in the world could be done with all the snakes that were caught. The last chapter, however, is a plea for conservation of snakes. The book seems more likely to stimulate wholesale snake hunting than snake conservation.

LeBuff, Charles R., Jr. (1025 8th Ave. North, Naples, Fla.) OBSERVATIONS ON CAPTIVE AND WILD NORTH AMERICAN CROCODILIANS. Herpetologica 13(1): 25-28. Mar. 1957.

Claims that mating is not violent in Am. alligator and that mother does not defend eggs or young. Observations to contrary are attributed to basking on nest because it is a high, dry spot, and to food-getting and defense of territory.

Legler, John M. (U. Kans.) A SIMPLE AND PRACTICAL METHOD OF ARTIFICIALLY INCUBATING REPTILE EGGS. Herpetologica 12(4): 290. Dec. 1956.

In finger bowls, between layers of moist absorbent cotton.

Mosimann, James E. (U. Montreal, Case Postale 6128, Montreal, P. Q.) VARIATION AND RELATIVE GROWTH IN THE PLASTRAL SCUTES OF THE TURTLE KINOSTERNON INTEGRUM. Misc. Publs. Mus. Zool. U. Mich. no. 97. 43 p., 1 pl., 24 figs. Nov. 1956.

Statistical work of value in studies of chelonian taxonomy and growth.

Neill, Wilfred T. (Ross Allen Reptile Inst., Silver Springs, Fla.) DISTRIBUTIONAL NOTES ON GEORGIA AMPHIBIANS, AND SOME CORRECTIONS. Copeia 1957(1): 43-47. Apr. 1957.

Discussions of distribution and local status of many forms.

Parrish, H. M., J. E. Scatterday, and Wellington Moore. (Scatterday & Moore: Fla. State Bd. Health, Jacksonville.) THE USE OF ANTIHISTAMINE (PHENERGAN) IN EXPERIMENTAL SNAKE VENOM POISONING IN DOGS. J. Am. Vet. Med. Assn. 129(11): 522-525. Dec. 1956.

On the average, about 360 dogs a year are treated for snake bite by veterinarians in Fla. Mortality is 25.8%. Antihistamines are commonly used in treatment. The authors gave dogs doses of Crotalus atrox venom and treated some of them with Phenergan. "The survival time of the treated animals was less than that of the untreated animals. Evidently, the drug potentiated the toxicity of the venom... Antihistamine drugs are contraindicated in the treatment of snake venom poisoning in dogs."

Saint-Girons, H., and M.-C. Saint-Girons. CYCLE D'ACTIVITÉ ET THERMORÉGULATION CHEZ LES REPTILES, (LÉZARDS ET SERPENTS). Vie et Milieu 7(2): 133-226, 30 figs. Dec. 1956.

In French. Has 3-p. summary and bibliography of 155 titles. Original data, much of it in graphs and tables, are presented for several species, particularly Coronella austriaca, Anguis fragilis, and Lacerta viridis. This review paper also brings together in discussion and tables the work of other authors. General conclusions given in summary include: Temperature is the most important single factor affecting activity and geographic distribution of reptiles. Digestion and incubation are the physiological functions most sensitive to temperature. Temperature acts on reptiles primarily through substratum and by insolation. As a general rule, lizards are more thermophilic than snakes, with an average difference of about 5°C. in the same region. Minimum lethal temperature of

snakes and lizards is about -2°C. in temperate and cold regions and about 0.5°C. in warm regions. Maximum lethal temperature is about 43-44°C. among snakes and lizards in temperate and cold regions and about 48-49°C. among lizards in warm regions. Optimum temperature is about 26-34°C. for snakes, 27-39°C. for lizards. Minimum temperature tolerated voluntarily is 4-29°C. among lizards, 4-24°C. among snakes. Maximum temperature voluntarily tolerated is 37-42°C. among lizards, 34-37°C. among snakes. Humidity, wind, insolation, and atmospheric pressure have little influence on the activity cycle; effects of rain are variable. Effect of day-length is not as great as in mammals and birds. Innate factors such as reproduction, food procurement, and shelter requirements also have a profound influence on activity cycle.--L. F. Stickel.

Schwartz, Albert. (Albright Coll.) GEOGRAPHIC VARIATION IN THE CHICKEN TURTLE. Fieldiana-Zoology 34(41): 461-503, 7 figs. Nov. 1956.
Taxonomic revision with good account of variations. Three ssp., 2 of them new, are recognized.

Stewart, Margaret McBride. CERTAIN ASPECTS OF THE NATURAL HISTORY AND DEVELOPMENT OF THE NORTHERN TWO-LINED SALAMANDER, EURYCEA BISLINEATA BISLINEATA (GREEN), IN THE ITHACA, NEW YORK, REGION. Ph.D. thesis, Cornell U. 156 p. 1956. [From long abstract in Dissertation Abstracts 16(12).]

Tinkle, Donald W. (W. Texas State Coll., Canyon.) ECOLOGY, MATURATION AND REPRODUCTION OF THAMNOPHIS SAURITUS PROXIMUS. Ecol. 38(1): 69-77, 1 graph. Jan. 1957.
Studies made in Sarpy Wildl. Refuge of Tulane U. Topics: habitat preference, movements, seasonal abundance and abundance in relation to other species of snakes, hibernation, effect of rain, reproduction, growth, age and size at maturity.--L. F. Stickel.

Woodbury, Angus M. (U. Utah.) USES OF MARKING ANIMALS IN ECOLOGICAL STUDIES: MARKING AMPHIBIANS AND REPTILES. Ecol. 37(4): 670-674. Oct. 1956.
Review of marking methods and results obtained in various studies.

Woodbury, Angus M., and Dale D. Parker. (U. Utah.) A SNAKE DEN IN CEDAR MOUNTAINS AND NOTES ON SNAKES AND PARASITIC MITES. Herpetologica 12(4): 261-268, 2 graphs. Dec. 1956.

Yunker, Conrad E. (Dept. Zool., U. Md.) STUDIES ON THE SNAKE MITE, OPHIONYSSUS NATRICIS, IN NATURE. Science 124(3229): 979-980. Nov. 16, 1956.

Zweifel, Richard G. (Am. Mus. Nat. Hist., N. Y.) STUDIES ON THE CRITICAL THERMAL MAXIMA OF SALAMANDERS. Ecol. 38(1): 64-69, 2 graphs. Jan. 1957.

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